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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL,

1882—1883.

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1883.

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1882—1883.

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Office

MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1882—83.

116, *Victoria Street, April* 5, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | LIEUT.-GENERAL STRACHEY.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of last meeting (March 23) were read and confirmed.

Read—The following letter:—

M.O. 793.

SIR, Downing Street, March 31, 1882.

I AM directed by the Secretary of State for the Colonies to acknowledge the receipt of your letter of the 24th instant, with enclosures, relative to the proposed organization of a system of storm warnings for the China coasts.

It appears to Lord Kimberley that for such a system to be of real practical value, the co-operation of all the different Governments concerned is essential, and that for furthering this object the assistance of the Foreign Office would probably be necessary; but with regard to Hong Kong, I am to inform you that before taking any steps in the matter his Lordship has thought it desirable to request Mr. Price, the Surveyor-General of the Colony, who is at present in this country on leave of absence, and who has taken much interest in the question of meteorological observations in Hong Kong, to put himself into communication with you in order to ascertain in what way the assistance of the Hong Kong Government could best be given towards establishing and carrying out such a system as that which is contemplated, and how it is proposed that the necessary expenses should be defrayed.

I am, &c.

The Secretary to the Meteorological Office. (Signed) R. H. MEADE.

The Secretary reported that several replies had been received to the circular issued by the Council asking for suggestions as to possible improvements in the Weekly Weather Reports, Minutes, 1881, p. 81, and submitted the following:—

SUMMARY OF THEIR CONTENTS.

I. Messrs. Lawes and Gilbert (Letter 675):

(*a.*) The results should be tabulated for *calendar months*, for the sake of comparison with earlier records.

(*b.*) The dew point and the degree of humidity should be given—the monthly means (apparently) would suffice.

They would prefer to tabulate "degrees of dryness" instead of "degrees of humidity," *e.g.*, a relative humidity of 87 would be 13° of dryness. They think that a tabulation of mean temperature, of mean dew point, and of the difference between the two would suffice.

(*c.*) Aggregate temperatures should be tabulated.

Viz.:—"There should be a record showing the aggregate number of degrees of temperature above some well-considered base line, from time to time as the season advances, so that the value of the record might be tested for various agricultural crops, and other plants.

The total number of hours of sunshine might also be given.

(*d.*) Records of the temperature of the soil, of evaporation and percolation, are important, but could hardly be supplied by the Meteorological Office.

II. W. T. Thiselton Dyer, Esq., F.R.S. (Letter 2386/81):
What is most needed is a cumulative record—
(α.) Of rainfall.
(β.) Of sunshine.
(γ.) Of heat.
The difficulty of obtaining a cumulative record of the last-named element is admitted by Mr. Dyer, who refers (like Messrs. Lawes and Gilbert) to the experiments of De Candolle.

III. The Rev. W. C. Ley (Letter 235):
Would add two monthly charts showing the variations from the mean temperature and mean rainfall of each district.
Even quarterly charts would be useful, but for the sake of the Monthly Charts Mr. Ley would be prepared to sacrifice the daily 8 a.m. chart of the Weekly Weather Report.

IV. The Meteorological Society (Letter 81):
Observations of earth temperature are very desirable.

V. Rev. F. M. Stow (Letter 2485/81) would suggest—
(*a*.) A larger number of sunshine records.
(*b*.) Records of the temperature of the soil near the surface.
(*c*.) Some hygrometric record—the dew point is recommended.
(*d*.) The "difference from the average" should be omitted, except when the average is well ascertained, say for 8 or 10 years.
(*e*.) Temperature should not be corrected for height above sea-level.

VI. Rev. T. A. Preston (Letter 2325/81):
The addition of records of underground temperature would be desirable, but is not necessary.

VII. The Botanical Society (Letter 2278/81) consider the questions relate to matters beyond their province.

VIII. The answers of Mr. G. J. Symons (Letter 2307) and Colonel Turbervill (Letter 2196) relate to weather forecasting.

A memorandum by Mr. Gaster on the subject (Letter M.O. 833) was also submitted.

Resolved—That a plan for a monthly supplement to the Weekly Weather Report be prepared and submitted, to provide for—
(*a*.) Monthly Means } of sunshine, rainfall,
(*b*.) Cumulative values } and temperature.
(*c*.) A chart or charts of Isabnormals.

The further discussion of the suggestions relating to hygrometry and evaporation was postponed.

Mr. Scott was instructed to ascertain what records of temperature of the soil are available in the United Kingdom.

Resolved—That the sunshine records for 1881 be published on the plan proposed in the Report of the Council for 1880, p. 19.

Mr. Scott reported that he had ascertained from Mr. Malby (Letter M.O. 767) that the outlines of the Charts for the Atlantic and Indian Oceans had been preserved on stone, and that the extra cost of drawing certain isotherms in red on the Sea Temperature Charts would only amount to 2*l*. for 1,000 copies.

The Hydrographer was requested to give Mr. Malby instructions with reference to the printing of this series of charts, and to direct him to furnish to the Office an estimate for the completion of the work in accordance with these instructions.

Read—The following letter (Minutes, 1881, p. 113):—

M.O. 825.

SIR, Elswick Works, Newcastle-upon-Tyne, 4th April 1882.

I REGRET that I have delayed so long in answering your letter numbered M.O. 338. I had intended to have called and conferred with you on the subject, but from illness and other causes have not recently been so much in London as usual.

In reply to your queries I may state that I am satisfied there would be no difficulty in having a series of observations made at Shoeburyness as you propose. The gun and the carriage which we have used with it, my firm will be happy to lend for the purpose, and I shall myself, in concert with Mr. Galton, be happy to assist at the experiments.

I think I could arrange, should the Council desire it, for experiments to be made in May next. If you will inform me of your concurrence I will at once communicate with the War Office authorities.

I am, &c.
A. NOBLE.

R. H. Scott, Esq., M.A., F.R.S.,
Meteorological Office, London.

Mr. Scott was instructed to state in reply (Letter M.O. 825) that the Council would wish an application to be made to the War Office for leave to carry on the experiments, and also to inquire if Captain Noble could form an estimate of the probable cost.

Mr. Scott reported that he had been elected a member of the International Polar Commission (Minutes, 1881, p. 125).

He also reported that he had learnt from the President of the Royal Society that the Home Government and the Canadian Government had agreed to grant funds for the proposed observing station at Fort Rae on the Great Slave Lake.

Read—A memorandum from Captain Toynbee reporting that since the last meeting four logs had been received, all of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. Jas. Buchan -	Barque "Coppename."	Oct. 24, 1881—March 24, 1882.	Greenock, Nickerie, Demerara and home.	1881, p. 55.
Capt. Jas. Gordon -	S.S. "City of Agra."	Jan. 10—March 30, 1882.	Liverpool, Calcutta, and home.	1881, p. 99.
Capt. J. C. Prout -	"Cape St. Vincent"	May 23, 1881—March 4, 1882.	Dundee, San Francisco, and home.	—
Capt. C. H. Renaut -	"Pleione" -	July 23, 1881—March 29, 1882.	London, Wellington, and home.	1881, p. 30.

Mr. Scott was instructed to present the Charts (O. 27) to Captain Prout, and to convey the best thanks of the Council to the other observers.

Reported—That fishery barometers had been issued on loan to Bray (Ireland) and to Donegal.

Read—The following report:—

SIR, Meteorological Office, March 31, 1882.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 31st March 1882.

The Sea Surface Temperature Charts for the three oceans have been completed. I had the honour to submit them to the Council on the 10th of this month (Minutes, p. 134), since that date I have been occupied with their preparation for publication, and have made some progress with the preliminary remarks and explanation to accompany them.

I am, &c.
C. W. BAILLIE,
Nav. Lieutenant, R.N.
HENRY TOYNBEE,
Marine Superintendent.

Capt. H. Toynbee, F.R.A.S.,
Marine Superintendent.

Resolved—That an increase in salary of 50*l.* per annum be granted to Mr. Baillie, to take effect from the 1st instant.

Submitted—The following statements of work for March 1882:—

MARINE ROOM.

Examined 16 new logs.

Cape of Good Hope District.

Cape Gales.—Plates I. to V. for January sent for revise, and Plates VI. to XX. sent to be lithographed.

Work connected with the letterpress.

Barometer Means for Globe.

Staff chiefly employed on barometer observations in the North and South Atlantics for the months of February, May, August, and November: Observations for the Indian Ocean commenced.

Means for February and May in the North Atlantic worked.

General.

Assisting in the discussion of Sea Temperatures for all Oceans.

Instructing Mr. Sheerman in working Bessel's formula prior to his using the Harmonic Analyser.

Instructing Mr. Dunn.

Posting Index of Data in Ocean 10° Squares.

CHARLES HARDING.

HENRY TOYNBEE,
Marine Superintendent.
April 4, 1882.

R. H. Scott, Esq.

March 31, 1882.

PANTAGRAPH ROOM.

Copper Plates pantagraphed:—11 plates, Nos. 19 to 26, and 29 and 30, 1877.

Zinc Plates.—Barograms, 16 plates, Nos. 25 to 40, 1877; Thermograms, 5 plates, Nos. 40 to 44, 1877; Vapour tension, 7 plates, Nos. 24 to 30, 1877; Anemograms, 14 plates, Nos. 41 to 54, 1877; Rain curves, 6 plates, Nos. 37 to 42, 1877.

Photographic Curves are prepared to Plate 42 for barograms, and Plate 49 for thermograms.

Harmonic Analyser.—The analysis of the temperature curves for 1873 has been commenced within the last few days, and two months' curves for Valencia have been passed through the instrument.

R. H. Scott, Esq., F.R.S. R. H. CURTIS.

EXAMINATION ROOM.

April 1, 1882.

The following curves and tabulations have been examined:—August (1881): *Thermograms*, five stations; *Barograms*, one station.

January (1882): *Thermograms*, two stations; *Barograms*, two stations; *Anemograms*, two stations.

February (1882): *Thermograms*, two stations; *Barograms*, one station: *Anemograms*, two stations.

Mr. Aldridge's absence for one week on sick leave somewhat retarded the progress of the work.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary. T. E. ALLEN.

Reported—That several of the clerks had applied for increase of salaries. The Chairman was requested to examine the applications with the Secretary, and report to the Council.

The following cheques for March were drawn on the 31st of that month:—

Administration:	£	s.	d.	£	s.	d.
Professor H. J. S. Smith, salary	293	3	10			
W. De La Rue, fees	124	13	7			
Sir F. J. O. Evans, K.C.B., fees	102	15	4			
F. Galton, fees	162	10	10			
Professor G. G. Stokes, fees	146	6	4			
Lieut.-General R. Strachey, C.S.I.	146	6	3			
				*975	16	2
R. H. Scott, salary	-		-	66	13	4
J. S. Harding, jun.	27	15	6			
T. D. Bell — Salaries and wages	13	6	8			
J. S. Harding, sen.	†8	19	8			
				50	1	10
C. W. Jacques, rent, No. 116	133	13	0			
„ „ No. 113	18	0	6			
				151	13	6
Pall Mall Coal Company, coals	-		-	5	5	0
Bank of England, Stationery Office forms	11	6	4			
„ Annual Reports	38	7	10			
				49	14	2
General Life and Fire Insurance Co., fire insurance	1	6	0			
„ „ „	1	2	0			
				2	8	0
J. Jackson, copying ink	-		-	2	5	0
Pickford & Co., carriage of parcels	-		-	0	18	1
Carried forward	-		-	£1,304	15	1

	£	s.	d.
* Deductions for income tax	20	16	8
Expenses (per J. S. Harding, jun.); cash book p. 66	3	7	2
Payment this day as above	975	16	2
	£1,000	0	0

† Four weeks ending 25th March.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	1,304	15	1
Special Researches and Experiments:						
Army Pay Office, balloon, &c. - - -	-		-	123	0	2
Captain J. Templer, balloon expenses - -	-		-	29	17	6
Kew Committee, tabulation of electrograms, &c.	-		-	9	3	5
W. Marriott, meteorological charts - -	-		-	34	15	0
C. E. Strachan, Arctic work - - -	-		-	2	0	6
W. Thomas, care of Scilly anemometer -	-		-	1	13	6
H. Williams, care of "Bridled" anemometer -	-		-	3	9	1
Land Meteorology:						
C. Niven, Aberdeen observatory - -	-		-	69	2	1
Executors of late T. R. Robinson, Armagh Observatory - - - - -	46	19	0			
„ „ (expenses) - -	19	7	8			
				66	6	8
W. L. Fox, Falmouth Observatory - -	72	3	4			
„ „ (expenses) -	20	11	11			
				92	15	3
R. Grant, Glasgow Observatory - -	-		-	69	18	4
H. Williams, Holyhead - - -	-		-	5	19	1
Kew Committee, allowance to Observatory -	100	0	0			
„ waxed paper - - -	10	0	0			
„ postages, &c. - -	2	18	4			
				112	18	4
C. Clouston, Orkney - - - -	-		-	2	16	9
G. H. Aird, Seaham - - - -	-		-	2	13	9
S. J. Perry, Stonyhurst - - -	-		-	56	6	2
J. E. Cullum, salary - - - -	16	13	4			
„ (expenses) - - -	47	19	4			
				64	12	8
G. T. Watson, Yarmouth - - - -	-		-	4	0	0
P. Adie, barogram scales, &c. - - -	-		-	8	17	0
Hopkin and Williams, chemicals - -	-		-	8	18	2
Meteorological Society, observations - -	-		-	25	0	0
R. W. Munro, barogram tabulators - -	-		-	23	18	6
R. H. Curtis -	22	4	5			
J. A. Curtis -	15	11	1			
T. E. Allen - } Discussion, &c. of observations	15	11	1			
C. H. Thompson	*9	4	0			
E. G. Aldridge -	*7	6	8			
				69	17	3
Weather Information and Forecasts:						
J. W. Mayes, Ardrossan - - -	-		-	1	0	3
Postmaster, Bundoran - - -	-		-	1	4	0
H. Todd, Cambridge - - - -	-		-	4	11	0
Postmaster, Cliffony - - - -	-		-	0	18	0
H. Mohn, Christiania - - - -	-		-	5	10	0
T. MacGowan, Donaghadee - - -	-		-	0	12	0
J. Costello, Dover - - - -	-		-	4	1	6
W. Brand, Dunrossness - - -	-		-	3	5	3
Postmaster „ - - -	-		-	1	2	3
W. Foster, Hawes Junction - - -	-		-	3	18	3
J. Tilston, Holyhead - - - -	-		-	3	18	0
G. G. Appleton, Hurst Castle - - -	-		-	3	18	8
Postmaster, Inverness - - - -	-		-	1	6	0
J. Fisher, Jersey - - - -	-		-	4	6	6
Postmaster, Killarney - - - -	-		-	0	18	0
J. Hutchison, Leith - - - -	-		-	0	13	0
Postmaster, Lerwick - - - -	-		-	1	2	0
F. Gaster, London - - - -	-		-	3	18	0
Carried forward -	-		-	£2,238	16	11

* Four weeks to the 25th March.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	2,238	16	11
Weather Information and Forecasts—*cont.*						
K. Kerr, Mullaghmore - - -	3	19	2			
W. Conway „ - - - -	5	17	7			
				9	16	9
W. D. Penny, Nairn - - - -	-		-	4	4	6
M. Mackintosh „ - - - -	-		-	0	13	0
E. J. Lowe, Notts - - - -	-		-	3	18	0
W. Wickham, Oxford - - - -	-		-	3	13	2
G. Phillips, Parsonstown - - -	-		-	3	7	6
E. Kennedy „ - - -	-		-	0	13	0
J. John, Prawle Point - - - -	-		-	3	5	0
G. Blake, St. Ann's Head - - -	-		-	4	0	4
W. Thomas, Scilly - - - -	-		-	4	12	2
J. B. Smith, Spurn - - - -	-		-	3	5	5
A. M. Macdonald, Stornoway - - -	-		-	5	11	3
Postmaster, Stornoway - - -	-		-	1	6	0
„ Valencia - - - -	-		-	0	12	0
J. Sinclair, Wick - - - -	-		-	3	5	0
J. Murray „ - - - -	-		-	1	6	0
G. T. Watson, Yarmouth - - -	-		-	4	12	0
A. Guy, York - - - - -	-		-	3	18	0
Postmaster General, telegrams - - -	-		-	195	6	6
F. Gaster - }						
W. L. Dallas - } Preparation, &c. of Weather	30	7	6			
F. Brodie - } Charts.	19	15	1			
G. G. Francis - }	19	15	1			
	18	3	4			
				88	1	0
Inspections:						
A. Buchan, salary - - - -	-		-	37	10	0
W. C. Ley, „ - - - -	-		-	37	10	0
Ocean Meteorology:						
Captain H. Toynbee - - } Discussion, &c.	33	6	8			
Nav. Lieut. C. W. Baillie, R.N. } of observa-	16	13	4			
R. Strachan - - - } tions, and	27	15	6			
C. Harding - - - } care of in-	22	4	5			
H. Harries - - - } struments.	*11	4	0			
				111	3	11
P. Adie, repairing "A" barometers - -	5	0	10			
„ „ "B. T." „ - -	1	11	0			
				6	11	10
P. A. Feathers, Dundee agent - - -	-		-	1	5	0
J. Gill, Liverpool agent - - -	-		-	19	12	10
J. Jones, Aberdeen agent - - -	-		-	5	6	9
J. H. Woodstock, packing cases - -	-		-	1	10	6
T. Riddle, care of Bermuda anemometer -	4	12	0			
„ „ „ -	2	4	0			
				6	16	0
Miscellaneous:						
R. J. Lecky, commissions - - -	-		-	3	5	0
J. S. Harding, junr., petty cash - -	100	0	0			
„ „ - -	80	0	0			
				180	0	0
Total -				£2,994	15	4

A cheque was drawn on the 20th March for 27*l.* in favour of S. C. Tisley & Co. (Commissions account).

* Four weeks to the 25th March.

116, *Victoria Street, April* 19, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	GENERAL STRACHEY.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 5) were read and confirmed.

Read—The following letter:—

CERTIFICATES.

M.O. 826.—M. 5084. Board of Trade (Marine Department),
Whitehall Gardens, S.W., April 5, 1882.

SIR,

I AM directed by the Board of Trade to transmit herewith a copy of a circular they are about to issue giving notice that after the 1st July next the subject of the Law of Storms will form part of the examination of all applicants for Masters' Certificates of Competency for Foreign-going Ships, and to request you to be good enough to move the Meteorological Council to inform them whether the five questions contained on the third page of the circular are in themselves correct, and what form of words in answer to each of these questions would, in the opinion of the Council, be most correct.

I am further to inquire whether the Barometer Manual is now in print, and, if not, whether the Council have any objection to this Board's printing extracts from it, or reprinting it, for the use of their examiners; and, whether in reprinting the whole or any parts of it, they would suggest any alterations.

I am, &c.

The Secretary, Meteorological Office. (Signed) THOMAS GRAY.

LAW OF STORMS.

Questions to be answered by Applicants.

AN applicant for a Master's Certificate for Foreign-going Vessels must answer, in writing, on paper supplied to him by the examiner, the following questions, numbering the answers to correspond with the questions.

Question:—

1. The direction of the wind in a cyclone being * _____, state the probable bearing of its centre from the ship in the * _____ Hemisphere.
2. And supposing that the wind during the passage of the same storm were to veer towards the * _____, what would be the ship's position with reference to the (line of) progression of the storm's centre; and what action would you take?
3. Under what conditions would the rule as to the veering of the wind in the storm be the reverse of the above?
4. What are the usual indications of a vessel being on the axis line of a cyclone?
5. What are the usual indications of a vessel approaching the centre of a cyclone, and when receding from it?

The Chairman submitted draft answers to the questions, and suggestions for the modification of their wording, which had been prepared at his request by Mr. Scott, Captain Toynbee, and Mr. Baillie; and the Hydrographer was requested to consider the amendments to the questions, and the form of answers proposed.

The Secretary was instructed: I. On the receipt of the questions and answers from the Chairman to forward them to the Board of Trade. II. To request the Board of Trade to forward to the Meteorological Council such extracts from the B. T. Barometer Manual (Ed. 1871) as they would desire to reprint, informing the Board that the Council would undertake to revise these extracts.

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* These spaces to be filled in by the examiners, and frequently varied.

Read—The following letter (Minutes, 1881, p. 131) :—

M.O. 841.—R. S. & C. 520.

SIR, India Office, S.W., April 6, 1882.

I AM directed by the Secretary of State for India in Council to acknowledge the receipt of your letter of the 13th ultimo, on the subject of Mr. Dallas's appointment as scientific assistant to the meteorological reporter to the Government of India.

In reply, I am to state that, under the circumstances represented in your letter, Mr. Dallas's appointment will be dated from the 1st September next, instead of from the 3rd ultimo, as at present arranged, and that he will be required to report himself in India by the 1st of November next.

He will be allowed to draw two-thirds of his Indian pay from the 1st of September up to the date of his arrival in India, on condition that he prepares himself as proposed in your letter under reply.

I am, &c.

The Secretary, Meteorological Office. (Signed) ENFIELD.

Mr. Scott was instructed to make arrangements for the commencement of a special course of study in the Marine Room, by Mr. Dallas.

The Secretary (as directed at last meeting) submitted, (A) The following lists of stations at which observations of earth temperature (at various depths) are being taken at present :—

OBSERVERS of EARTH TEMPERATURE sending RETURNS to METEOROLOGICAL SOCIETY.

Alnwick	J. Lingwood.
Apsley Guise (Woburn)	E. E. Dymond.
Babbacombe	E. E. Glyde.
Cardiff	W. Adams.
Croydon	E. Mawley.
Cullompton	T. Turner.
Harestock (Hants)	Lieut.-Col. H. S. Knight.
Hodsock (Worksop)	H. Mellish.
Isleworth	Miss E. A. Ormerod.
Lowestoft	S. H. Miller.
Marlborough	Rev. T. A. Preston.
Norwood	W. Marriott.
Oakamoor (Cheadle)	J. G. Williams.
Regent's Park	W. Sowerby.
Southampton	Rev. H. Garrett.
St. Leonard's	H. Colborne.
Strelley (Carlisle)	T. L. K. Edge.
Worthing	W. J. Harris.

INDEPENDENT.

Camden Square	G. J. Symons, F.R.S.
Croydon	B. Latham.
Greenwich	The Astronomer Royal.
Weedon	E. G. Loder.

SCOTTISH STATIONS.

Arbroath.	Marchmont.
Barry.	Ochtertyre.
Callton-Mor.	Sandwick.
Dunrobin.	Smeaton.
East Linton.	Thirlestane Castle.

Dublin, Botanic Gardens, Glasnevin	J. Moore.
Isle of Man, Douglas	A. W. Moore.

(B) The following memorandum on the proposed reproduction of the sunshine records :—

MEMORANDUM on the REDUCTION of SUNSHINE RECORDS.

April 18, 1882.

To bring 12 months' Sunshine Returns into the space occupied by 2 pp. of the Weekly Weather Report, it will be necessary to place the lines a little closer together than in the specimen given in the Report of the Council for 1880–1, p. 19.

I would therefore suggest that a month's traces be reduced to a width of 1·25 inch, and this will give for a page,—

Six months' curves - - - -	7·5 inches.
Space for the insertion of the months -	·6 „
Do. for the time-scale, heading, &c. -	·3 „
Total -	8·4 inches.

The length of the last page of the Weekly Weather Report is 8·9 inches.

If it is thought desirable the time-scale might very easily be made more open, the width of the page allowing ample space for that purpose.

As to the time required for making the reduction, I think *one month* would suffice to prepare the returns for all the stations for twelve months.

R. H. Scott, Esq., F.R.S. R. H. CURTIS.

Read—The following letter :—

M.O. 827.

SIR, Falmouth, April 4, 1882.

I HAVE been requested by the Meteorological Committee of the Polytechnic Society to inform you that Mr. Squire has resigned the post of Superintendent of the Falmouth Observatory as from the 21st of July next, and that before appointing his successor they will be glad to be informed if the Council know of any suitable person whom they could recommend for the appointment.

Mr. Edward Kitto, who has acted as Mr. Squire's assistant for many years, is a candidate for the post vacated by Mr. Squire, and if he be appointed the Committee will be able to dispense with a portion of the grant.

I am, &c.
(Signed) WILSON L. FOX,
Hon. Secretary.

R. H. Scott, Esq.

The question of the continued maintenance of the seven self-recording observatories at which observations have now been taken, with one or two exceptions, for upwards of fourteen years was discussed.

It was considered that the principle to be followed in any decision which may ultimately be adopted should be to maintain only such a number of observatories as would suffice to furnish a continuous and accurate representation of the general course of meteorological changes in the British Isles. It was suggested that if the minimum number of three were adopted, the best situations would probably be Kew, Valencia, and Aberdeen, as they form a nearly equilateral triangle, covering the greater part of the United Kingdom.

The Secretary was instructed to write to Mr. Fox, stating that the Council see no objection to the nomination of Mr. Kitto as successor to Mr. Squire, but that, as it will be the duty of the Council to reconsider, during the present year, the number and position of the self-recording observatories, any appointment now made must be understood to be liable to be terminated at any time after proper notice. (Letter 918.)

Read—A memorandum from Captain Toynbee reporting that since the last meeting five logs had been received, all of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last Mention on Minutes.
Capt. W. N. Lailey	S.S. "Cipero" -	Oct. 22, 1881—April 14, 1882.	Belize, Glasgow, Trinidad, Demerara, and home.	1881, p. 92.
Capt. James Lawson	R.M.S. "Minho"	Jan. 2—March 23, 1882.	Brazil, River Plate, and home.	—
Capt. H. Longley -	S.S. "Yorkshire"	Aug. 31, 1881—April 5, 1882.	Yokohama, New York, and home.	1881, p. 18.
Capt. J. Raeburn, R.N.R.	"Lochee" -	July 26, 1881—March 30, 1882.	Cardiff, Calcutta, and home.	1881, p. 30.
Capt. J. W. Thorne	"British Commodore."	May 25, 1881—March 21, 1882.	New York, Calcutta, and home.	1881, p. 30.

Mr. Scott was instructed to present the Charts (O. 32) to Captain Lawson, and to convey the best thanks of the Council to the other observers.

The Chairman was requested to write to Mrs. Robinson, expressing the deep regret of the Council at the death of Dr. Robinson, and their sense of the great services rendered by him to meteorological science.

Professor Stokes was requested to write to the Primate of Ireland, explaining that the position of the self-recording observatories is under the consideration of the Council, and that it is consequently uncertain for how long the subsidy at present given to the Meteorological Observatory at Armagh will be continued.

Submitted—The following checking of the Forecasts for the month of March 1882:—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

2.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	31	43	37	78
,,	b	46	35	41	
,,	c	11	11	11	
,,	d	12	11	11	
Scotland, E.	a	35	19	27	83
,,	b	46	46	46	
,,	c	8	19	14	
,,	d	11	16	13	
England, N.E.	a	27	23	25	77
,,	b	54	50	52	
,,	c	11	15	13	
,,	d	8	12	10	
England, E.	a	30	26	28	84
,,	b	52	60	56	
,,	c	10	11	11	
,,	d	8	3	5	
Midland Cos.	a	19	37	28	81
,,	b	60	45	53	
,,	c	14	10	12	
,,	d	7	8	7	
England, S.	a	37	45	41	88
,,	b	45	48	47	
,,	c	10	7	8	
,,	d	8	—	4	
Scotland, W.	a	23	46	35	77
,,	b	58	27	42	
,,	c	8	8	8	
,,	d	11	19	15	
England, N.W.	a	19	35	27	74
,,	b	51	43	47	
,,	c	19	11	15	
,,	d	11	11	11	
England, S.W.	a	45	41	43	73
,,	b	26	33	30	
,,	c	11	19	15	
,,	d	18	7	12	
Ireland, N.	a	27	54	41	79
,,	b	50	27	38	
,,	c	19	4	12	
,,	d	4	15	9	
Ireland, S.	a	37	45	41	74
,,	b	33	33	33	
,,	c	15	14	15	
,,	d	15	8	11	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	57	63	60	88
,,	b	33	23	28	
,,	c	7	10	9	
,,	d	3	4	3	
Scotland, E.	a	53	30	42	80
,,	b	33	43	38	
,,	c	3	20	11	
,,	d	11	7	9	
England, N.E.	a	27	16	22	75
,,	b	50	57	53	
,,	c	16	20	18	
,,	d	7	7	7	
England, E.	a	47	37	42	82
,,	b	33	46	40	
,,	c	13	10	11	
,,	d	7	7	7	
Midland Cos.	a	40	33	37	72
,,	b	33	37	35	
,,	c	20	20	20	
,,	d	7	10	8	
England, S.	a	40	50	45	82
,,	b	43	30	37	
,,	c	17	16	16	
,,	d	—	4	2	
Scotland, W.	a	33	50	42	82
,,	b	53	27	40	
,,	c	14	20	17	
,,	d	—	3	1	
England, N.W.	a	23	33	28	78
,,	b	54	46	50	
,,	c	16	14	15	
,,	d	7	7	7	
England, S.W.	a	33	33	33	76
,,	b	46	40	43	
,,	c	14	27	21	
,,	d	7	—	3	
Ireland, N.	a	40	40	40	86
,,	b	54	37	46	
,,	c	3	16	9	
,,	d	3	7	5	
Ireland, S.	a	37	37	37	75
,,	b	33	43	38	
,,	c	23	20	22	
,,	d	7	—	3	

Summary.

British Isles	a	30	38	34	78
,,	b	48	40	44	
,,	c	12	12	12	
,,	d	10	10	10	
British Isles	a	39	38	39	80
,,	b	42	39	41	
,,	c	13	18	15	
,,	d	6	5	5	

Submitted—The following statement of accounts for the year ending 31st March 1882:—

Income.	£ s. d.	£ s. d.
Balance from year 1880–81		1,401 14 10
Vote for year 1881–2		15,000 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	18 15 2	
(2.) Special researches	7 10 2	
(3.) Observatories and stations	25 4 6	
		51 9 10
Supply of Weather Information:		
D.W. charts and forecasts	270 14 4	
6 p.m. charts	25 0 0	
Information for Press Agencies, &c.	98 0 2	
Telegrams	288 2 11	
		681 17 5
Supply of Ocean statistics		6 3 0
„ Miscellaneous data		21 0 6
Sale of Instruments, &c.:		
Mercantile Marine account	51 2 9	
Royal Navy	4 11 10	
		55 14 7
Commission charged on work done for Colonies, &c.		26 16 0
		£17,244 16 2

Expenditure.	£ s. d.	£ s. d.
Administration:		
Payment of Council	1,000 0 0	
Secretary	800 0 0	
Salaries and wages	705 10 11	
Rent, fuel, and lighting	654 18 2	
Furniture and fittings	124 12 2	
Incidental and contingent expenses	426 4 2	
		3,711 5 5
Special Researches:		
Sunshine records	21 16 0	
Alterations to harmonic analyser and salary of clerk	107 15 6	
Assistance in Mr. Strachan's Arctic work	30 0 0	
Balloon observation, &c. (including lost balloon)	245 19 8	
Thermometer screen experiments and Mr. Kingston	24 13 5	
Rainfall observations	200 0 0	
Payment to Mr. Abercromby (Barometer Manual)	15 15 0	
Payment to Capt. Toynbee (Cape work)	50 0 0	
Meteorological Atlas (Mr. Marriott)	34 15 0	
Scottish Meteorological Society (Ben Nevis observations)	100 0 0	
Fog experiments	86 7 8	
Transfers from heads "Weather Information" and "Ocean Meteorology"	150 0 0	
Sundry charges	89 12 2	
		1,106 14 0
Land Meteorology:		
Observatories and stations	2,576 1 7	
Discussion and reduction of observations	1,477 2 10	
		4,053 4 5
Weather Information and Forecasts:		
Telegraphic reports and storm warnings	3,131 4 0	
Preparation and issue of reports and forecasts	1,396 19 10	
		4,528 3 10
Inspections:		
Salaries and travelling expenses		523 19 11
Ocean Meteorology:		
Discussion and reduction of observations	1,414 5 8	
Expenses incidental to the supply of instruments:		
Proportion for care and issue of instruments	200 0 0	
Royal Navy	237 15 4	
Mercantile Marine	344 15 11	
Distant island and coast stations	22 0 0	
		2,218 16 11
Balance		1,102 11 8
		£17,244 16 2

Liabilities.	£ s. d.
To Post Office (partly estimated)	408 2 1
„ sundry creditors	646 12 7
„ „ (contracts or work uncompleted)	163 3 10
„ balance	1,102 11 8
	£2,320 10 2

Assets.	£ s. d.
By cash at Bank	1,519 11 5
„ „ at Office	233 10 10
„ „ at Valencia	50 0 0
„ sundry debtors	517 7 11
	£2,320 10 2

116, *Victoria Street, May* 4, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	GENERAL STRACHEY.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 19) were read and confirmed.

Read—The following letters (Minutes, 1881, p. 129):—

M.O. 1013.

The Royal Society, Burlington House, London, W., May 2, 1882.

SIR,

I AM directed by the Council of the Royal Society to forward to the Meteorological Council the enclosed letter received by them from the Treasury, together with a copy of a letter from the Postmaster General, concerning the priority and cost of meteorological telegrams.

I am, &c.,
(Signed) M. FOSTER.

R. H. Scott, Esq.,
Secretary, Meteorological Council.

M.O. 1013.

Treasury Chambers, April 5, 1882.

SIR,

ADVERTING to so much of the letter (22031) from this Board of 31st December last as relates to the priority and cost of meteorological telegrams, I am directed by the Lords Commissioners of Her Majesty's Treasury to enclose, for the information of the Council of the Royal Society, a copy of a letter upon the same subject of 24th January last from the Postmaster General, and I am to state that the reasons advanced in it appear to my Lords to be decisive against any change in the existing arrangements.

My Lords are satisfied that if, apart from the direct requirements of the Executive Government itself, the question of priority and differential rates were once opened to discussion between the Postmaster General and the various interests on behalf of which plausible arguments could be alleged, and powerful influence exercised, for preference in their favour, not only the public at large, but each of these same interests in its turn, would find that they had lost much more than they had gained in respect of the service which is now placed impartially at the disposal of all of them in the person of the first comer.

I have, &c.
(Signed) F. CAVENDISH.

The President of the Council
of the Royal Society.

M.O. 1013.

Treasury Chambers, January 24, 1882.

MY LORDS,

I HAVE the honour to acknowledge the receipt of your Lordships' letter of the 2nd instant, relative to the question of allowing priority to meteorological telegrams, and charging a special rate for the shorter telegrams.

As to the question of priority, I think the 41st and 48th sections of the Telegraph Act, 1863 [26 & 27 Vict. c. 112.], and the 17th section of the Telegraph Act, 1868 [31 & 32 Vict. c. 110.] are very clear that no message shall have priority unless it be sent by one of Her Majesty's Principal Secretaries of State, or the Board of Trade, or other Department of Her Majesty's Government. The Meteorological Council is not a Department of the Government, and it is therefore out of my power to grant priority to its messages. I agree, moreover, with your Lordships, that there is, primâ facie, great objection to grant privileges which it is very difficult to confine to those who first obtain them; if priority were accorded to meteorological telegrams it would be very difficult to withhold the privilege from the Trinity House, the National Lifeboat Institution, and the Police.

After all, even if Parliament were disposed to concede the privilege of priority to meteorological telegrams, I am by no means sure that it would be as valuable as the Meteorological Council believe. The Council have from time to time complained of delay in the transmission of their telegrams, but it has almost invariably been found on inquiry that the delay was due, not to the fact that the telegrams had to wait their turn, but to the fact that meteorological observations and warnings are sent to and from stations which possess limited facilities for telegraphing, for instance, Cliffoney and Stornoway. In these cases the telegrams have to be re-transmitted at various intermediate offices, and each operation of re-transmission necessarily occupies time; and inasmuch as the meteorological stations are placed at somewhat inaccessible points, it would, I fear, be impossible to avoid these re-transmissions without providing direct wires at a great expense. Steps are taken, whenever opportunity offers, to shorten the time occupied in transmission, and I may mention that in the case of Cliffoney (perhaps the most unfavourably situated of all the stations), an arrangement has recently been made which will remove two re-transmissions.

As regards the charges for the shorter telegrams, I would submit that the Meteorological Council is in receipt of a contribution from your Lordships towards the expenses of its work, including telegraphy. If the charge for the shorter messages were reduced the State would be making two contributions in respect of the same service.

The storm warnings would come under the description of "shorter messages," and I may explain that there are about 140 stations to which storm warnings are sent by telegraph. These warnings, important as they are for the preservation of life and property, are sent distinctly in the interests of certain classes of the community, to wit—shipowners, mariners, and fishermen; and the revenue of the Post Office should not, I venture to think, be charged with a portion of their cost any more than it is charged with a portion of the cost of the telegrams sent by the Trinity House. It seems to be a matter between the Meteorological Council and the class for whose direct benefit the warnings are sent.

I cannot, therefore, recommend that any reduction be made in the charge for the transmission of such telegrams.

There are strong reasons, moreover, as your Lordships point out in your reply to the Royal Society, against all differential rates whatever, and I do not think that the 15th and 16th sections of the Telegraph Act, 1868, contemplated any other than uniform charges throughout the United Kingdom.

I have, &c.
(Signed) HENRY FAWCETT.

The Lords Commissioners of
Her Majesty's Treasury.

Reported—That the following letter had been sent to the Board of Trade (Minutes, p. 7):—

P.C. 996.—M.O. 826.

SIR, Meteorological Office, May 2, 1882.

I HAVE laid your letter of the 5th ultimo (M. 5084) before the Meteorological Council, and am instructed to inform you that in the opinion of the Council, the five questions submitted for their consideration include the most important points relating to revolving storms, in a manner sufficient for the purposes of the examination of candidates for Master's Certificates.

The Council venture to suggest a few verbal alterations in the questions, with the view of avoiding any possible ambiguity. They would prefer a heading such as "Questions relating to the "Cyclones, or Revolving Storms, common in Tropical Seas," to the heading "Law of Storms," on account of the vagueness of the latter phrase.

They would suggest (if there is no danger of overweighting this part of the examination) that a sixth question might be added relating to the tracks ordinarily taken by cyclones in each hemisphere, and to the seasons of the year in which they are of the most frequent occurrence.

The enclosed answers to the questions [not printed here] are purposely made as brief as possible, but seem to the Meteorological Council to be correct.

I am further requested to inform you that the Meteorological Council will gladly undertake to revise any extracts from the Board of Trade Barometer Manual (Edition, 1871) which the Board of Trade may select as likely to be useful to their Examiners or to candidates for Master's Certificates.

I am, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

The Assistant Secretary,
Marine Department, Board of Trade.

LAW OF STORMS.

Questions to be answered by Applicants.

An applicant for a Master's Certificate for foreign-going vessels must answer, in writing, on paper supplied to him by the Examiner, the following questions, numbering the answers to correspond with the questions.

Question:—

1. The direction of the wind in a cyclone being *_____, state the probable bearing of its centre from the ship in the *_____ hemisphere.

2. And suppose that the wind during the passage of the same storm were to veer towards the *_____, what would be the ship's position with reference to the (line of) progression of the centre of the cyclone; and what action would you take?

3. Under what conditions would the change in the direction of the wind in a cyclone be the reverse of the above?

4. What are the usual indications of a vessel being on the line of progression of the centre of a cyclone?

5. What are the usual indications that a ship is (a), approaching the centre of a cyclone; (b), receding from it.

Read—The following letter:—

M.O. 985.

SIR, Foreign Office, April 28, 1882.

I AM directed by Earl Granville to transmit to you a memorandum communicated by Count Sponneck, on behalf of the Danish Government, in support of representations made in favour of the construction of a line of telegraph to Iceland.

I am to state that Lord Granville will be glad to receive any observations which the Meteorological Office may have to offer on the subject.

I am, &c.

R. H. Scott, Esq., Meteorological Office, 116, Victoria Street, S.W. (Signed) CHARLES W. DILKE.

MEMORANDUM.

April 1882.

The Royal Government esteem it desirable to call attention to the fact that the great importance the line in question might have for meteorological science has been acknowledged by the meteorologists of the different countries, these having several times, especially at their Congresses in Bern, August, 1880, and in Vienna, September of the same year, unanimously declared the adoption of the project to be a progress of great international value for that department of meteorology relating to weather predictions, and the importance of which to sailors, as well as to agriculturists, is becoming more and more acknowledged in the countries of Northern and Western Europe.

His Majesty's Government find herein grounds for suggesting to foreign Governments interested in the matter the advisability of taking the opinions of the meteorological authorities in their respective countries with reference to the worth they are inclined to attach to the proposed line from a scientific point of view.

Should an international conference of meteorologists for deliberating on the execution of the project by international agreement be thought desirable, the different Governments are requested to communicate their ideas upon this point as well as to the time and place of meeting.

In case of Copenhagen, where extensive materials for the elucidation of the subject are at hand, being agreed upon as the seat of the Conference, this circumstance would afford pleasure to His Majesty's Government.

The Secretary was instructed to send the following reply (P.C. 1011) :—

SIR, May 4, 1882.

IN reply to your letter of the 28th ultimo, I am instructed to state that the Meteorological Council are of opinion that the establishment of telegraphic communication with Iceland would be of unquestionable advantage to meteorological science, and that, in particular, the information which would thereby be rendered obtainable would be of very great value for storm warnings, and in the preparation of forecasts of British weather.

The Council fully agree with the expressions in Count Sponneck's memorandum as to the general concurrence of opinion on the part of European meteorologists in favour of the proposal.

They venture, however, to observe that as there is no doubt as to this concurrence of opinion, the further questions which will arise in regard to the undertaking, being mainly financial, would hardly fall within the province of a conference of meteorologists.

I am, &c.

Sir Charles W. Dilke, Bart., M.P., Under Secretary, Foreign Office. (Signed) ROBERT H. SCOTT, Secretary.

The Secretary was instructed to send the following reply (P.C. 1051) to Dr. Neumayer's letter (Minutes, 1881, p. 107) :—

M.O. 182.

SIR, May 8, 1882.

REFERRING to your letter of January 13th, to which a first reply was sent on February 10th, I am instructed by the Council to state that they have resolved to undertake the study of the weather of the North Atlantic for the 13 months beginning August 1st, 1882, and ending September 1st, 1883.

I beg leave to forward to you at the same time copies of the appeal to shipowners and captains, and of the forms and instructions for observers which have been already issued.

You will observe that the appeal is based upon the connexion between Atlantic and British weather; and it is by putting prominently forward this purely national ground that the Council hope to secure the requisite amount of voluntary co-operation.

In an undertaking so distinctly limited in its scope, as well as in the period of time to which it refers, the Council can hardly ask the meteorologists of any other nation to join, although they desire to make it known that they will most thankfully accept any materials which may be communicated to them.

The Council have to express their warm thanks to you for allowing them to inspect your valuable series of synoptic charts, which they regard as an important contribution to meteorological science, and by which, as also by the results of other similar work, they have been encouraged to undertake the investigation of which I have informed you.

I am to assure you, that although at the present time they are not able to suggest any practical system of international action in relation to the preparation of synoptic charts, they are most desirous of co-operating cordially with yourself and the meteorologists of other nations.

I am, &c.

Dr. G. Neumayer, Deutsche Seewarte, Hamburg. (Signed) ROBERT H. SCOTT, Secretary.

He was also instructed to forward copies of the memorandum and form for the entry of observations to the meteorological institutions of Europe and the United States.

Read—A memorandum from the Circumpolar Committee of the Royal Society (**Letter 1,036**), requesting the advice of the Council on the subject of proposed actinometric observations at Fort Rae, on the Great Slave Lake (Minutes, p. 3).

The Secretary was instructed to reply (Letter 1023):—"That the Council, in view "of the difficulty in obtaining a suitable instrument and furnishing the requisite "instructions, during the short time which remains before the observer leaves "England, are not prepared to recommend that actinometrical observations be "undertaken at Fort Rae."

The Secretary submitted the following:—

STATEMENT relative to the present CONDITION of the RECORDS from the SEVEN S. R. OBSERVATORIES.

Observatories.	Record, began 1868.	Rain Gauges, began 1871.	Sunshine Record, began 1880.	Curves engraved and published.	Hourly Readings.	Reductions.	Wind.
Valencia -	August	January	January	All from January 1st, 1869, to December 31st, 1880, except 1877 and 1878, of which the engraving of 1877 is half done.	Lithographed from January 1st, 1874—December 31st, 1880. The printing of these readings from January 1st, 1881, has been commenced.	Daily, five-day, and monthly means for pressure, temperature, and vapour tension, for 1869–80 are complete, except for 1878, which is not finished.	The discussion was commenced, but abandoned.
Armagh -	May	April	January				
Glasgow -	January	March	March				
Aberdeen -	April	March	March				
Falmouth -	May	April	April				
Stonyhurst -	January	March	March				
Kew -	January	April	April				

No commencement has been made in the calculation of hourly means for the different months for pressure and temperature. These means have, however, been deduced for the year 1876 by Mr. H. S. Eaton, F.M.S., and could no doubt be obtained from him.

ROBERT H. SCOTT.

The Secretary was instructed to prepare an estimate of the cost of calculation of the hourly means for the elements named.

The subject of the proposed improvements in the Weekly Weather Report (Minutes, p. 2) was considered; and General Strachey and Mr. Galton were requested to propose a plan for recording cumulative values of temperature.

Read—A memorandum from Captain Toynbee reporting that since the last meeting seven logs had been received, four of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. E. C. Bennett	"Thessalus" -	June 15, 1881—March 29, 1882.	London, Sydney, and home.	1881, p. 3.
Capt. T. W. Freeman	S.S. "Bellerophon"	Dec. 14, 1881—April 25, 1882.	Liverpool and China -	1881, p. 88.
Capt. J. P. Holdich, R.N.R.	"British Envoy"	June 24, 1881—April 13, 1882.	San Francisco and home	1880, p. 54.
Capt. W. T. Littler	Barque "Corinth"	June 19, 1881—April 17, 1882.	Brisbane and home.	—

Mr. Scott was instructed to present the charts (O. 32) to Captain Littler, and to convey the best thanks of the Council to the other observers.

Submitted—The following Report:—

M.O. 961. Chemical Laboratory, St. Bartholomew's Hospital, E.C., April 24, 1882.

GENTLEMEN,

ACCORDING to your instructions received in December, we at once considered how the experimental investigation of the chemical nature of fog could best be carried out on a large scale. Our first intention was to use a fan driven by a small gas engine for passing the air through the filtering and absorbing apparatus, but on further consideration this plan was abandoned, and we have had a large, double-acting air-pump constructed, capable of drawing nearly 1,000 cubic feet of air per hour. The planning and construction of this pump, although we did all we could to expedite

matters, occupied considerable time, and the season for fogs was over before we received it. The necessary preliminary experiments with this instrument for ascertaining how the impurities can best be extracted from the very considerable volume of air which it is desirable to operate upon will occupy some time, and further the determination of the amount of the several impurities in the air in its normal condition, to serve as a basis of comparison, with what we may find to be present during the occurrence of fogs, will also require experiments extending over a considerable length of time. I have carried on for some months past, and consequently during several of the late fogs, determinations of the amount of carbonic acid present in the air in the City, and have obtained very important results, showing the great increase of the amount of this gas during fog. In some cases the increase amounted to upwards of two and a half times the quantity ordinarily present. The result is important, not only as demonstrating the presence of abnormal amounts of this gas during fogs, but also as indicating by its accumulation the probability that the proportion of other atmospheric impurities may be increased to a like extent.

We shall hope to have our methods of investigation well tested, and the necessary constants determined by next autumn; so that if during the ensuing winter there should be any dense fogs we may hope to obtain interesting data relating to their chemical composition.

I have, &c.

To the Meteorological Council. (Signed) W. J. Russell.

Mr. Scott reported that Mr. E. J. Lowe, F.R.S., had ceased to reside at Highfield House, Nottingham, and that the records from that station which had appeared in the Daily Weather Reports had been discontinued. Mr. Berridge, F.M.S., of Loughborough, had been appointed reporter for the district in place of Mr. Lowe.

The action taken was approved, and Mr. Scott was instructed to write to Mr. Lowe, expressing to him the warm thanks of the Council for his co-operation with them in their work.

Submitted—The following statements of work for April:—

Marine Room.

Examined 19 new logs and 3 lighthouse registers.

Cape of Good Hope District.

Cape Gales.—Received and examined revise of Plates I.—V. (January), and proofs of VI.—X. (July); also proofs of XI.—XX. for other months.

Revise of letterpress for January and July gales received and partially examined.

Barometer Means for Globe.

February isobars (experimental) for North Atlantic completed.

Charting of observations progressing.

General.

Obtaining information respecting Cumberland Sound for Dr. Neumayer.

Assisting in the discussion of Sea Temperatures for all Oceans.

Posting index of data in Ocean 10° squares.

Charles Harding.

R. H. Scott, Esq. Henry Toynbee,
Marine Superintendent.

Pantagraph Room.

Copper plates pantagraphed:—19 plates Nos. 27 and 28, and 31 to 37, 1877.

Zinc plates:—Barograms, 13 plates, Nos. 41 to 53, 1877; Thermograms, 9 plates, Nos. 45 to 53, 1877; Vapour Tension, 12 plates, Nos. 31 to 42, 1877; Anemograms, 8 plates, Nos. 55 to 62, 1877; Rain curves, 17 plates, Nos. 38 to 54, 1877.

The preparation of the photographic curves is not in advance of the zinc plates.

The harmonic analysis of the Valencia temperature curves for 1873 has been completed.

R. H. Scott, Esq., F.R.S. R. H. Curtis.

Examination Room.

Sir,

The following curves and tabulations have been examined:—August (1881): *Thermograms*, one station; *Barograms*, four stations; *Anemograms*, five stations.

September (1881): *Thermograms*, one station.

February (1882): *Barograms*, one station.

March (1882): *Thermograms*, two stations; *Barograms*, two stations; *Anemograms*, one station.

During the month I was absent from Office on three days (Easter vacation) and Mr. Aldridge on seven days.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., Secretary. T. E. Allen.

Submitted—A memorial (Letter 2248), from Mr. J. S. Harding, Sen., the Office-keeper, stating his claims for a pension.

The Secretary was instructed to forward the memorial for the favourable consideration of the Treasury.

The following cheques for April were drawn on the 29th of that month:—

		£ s. d.	£ s. d.
Administration:			
R. H. Scott, salary		- - -	66 13 4
J. S. Harding, jun.	Salaries and wages	27 15 6	
T. D. Bell	Salaries and wages	13 6 8	
J. S. Harding, sen.	Salaries and wages	*11 4 7	
			52 6 9
Gas Light and Coke Company, gas		- -	5 5 4
G. A. Gillett, wood, &c.		- -	1 1 10
Pall Mall Coal Company, coals		- -	3 0 0
H. Bond & Son, Office repairs		- -	30 10 0
F. Hatchett, multiplex copying plates		- -	1 2 0
E. Higgs, cleaning windows		- -	2 15 0
Pickford & Co., carriage of parcels		- -	4 7 4
Williams and Norgate, books		- -	8 6 8
Special Researches:			
T. De La Rue & Co., sun-cards		- -	12 5 0
Land Meteorology:			
C. E. Burton, tabulating observations		- -	7 10 0
J. E. Cullum, salary		- -	16 13 4
Gildea and Walker, photo-dish		- -	0 16 8
R. H. Curtis	Discussion, &c. of Observations.	22 4 5	
J. A. Curtis	Discussion, &c. of Observations.	15 11 1	
T. E. Allen	Discussion, &c. of Observations.	15 11 1	
C. H. Thompson	Discussion, &c. of Observations.	*11 10 0	
E. G. Aldridge	Discussion, &c. of Observations.	*9 3 4	
			73 19 11
Weather Telegraphy and Forecasts:			
F. Dangerfield, delivery of D.W. charts		- -	10 19 0
Postmaster General, telegrams		- -	178 2 1
Spottiswoode & Co., use of private wire		- -	17 0 0
W. Wightman & Co., printing		- -	8 2 6
F. Gaster	Preparation, &c. of Weather Reports.	31 13 6	
W. L. Dallas	Preparation, &c. of Weather Reports.	20 12 1	
F. Brodie	Preparation, &c. of Weather Reports.	20 12 1	
G. G. Francis	Preparation, &c. of Weather Reports.	18 18 4	
			91 16 0
Ocean Meteorology:			
Capt. H. Toynbee	Discussion, &c. of observations and care of instruments.	33 6 8	
Lieut. C. W. Baillie, R.N.	Discussion, &c. of observations and care of instruments.	20 16 8	
R. Strachan	Discussion, &c. of observations and care of instruments.	27 15 6	
C. Harding	Discussion, &c. of observations and care of instruments.	22 4 5	
H. Harries	Discussion, &c. of observations and care of instruments.	*14 0 0	
			118 3 3
Kew Committee, verifications		12 15 0	
„ „		9 9 0	
			22 4 0
S. W. Bidwell, transcribing corrected proof		- -	2 10 0
Pewtress & Co., advertisements		0 15 0	
„ printing		0 17 6	
			1 12 6
H. J. Thatcher, Cardiff agent		- -	3 12 0
C. H. Permain, Southampton agent		- -	7 2 6
Miscellaneous:			
Kew Committee, commissions		- -	14 3 0
R. Strachan, „		- -	4 4 0
J. S. Harding, jun., petty cash		- -	80 0 0
		Total -	£846 4 0

* Five weeks ending 29th April.

116, *Victoria Street, May* 17, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	GENERAL STRACHEY.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 4) were read and confirmed.

Read—The following letter:—

DEAR SIR, 49, Belgrave Square, May 10, 1882.

I HAVE been requested by the Council of the Meteorological Society of Scotland to bring under your notice the proposed establishment of a permanent meteorological observatory on Ben Nevis.

The scientific and practical value of high-level stations is admitted on all hands, and such stations have already been established in many foreign countries.

It is believed that the proposed site on Ben Nevis, being the highest in Great Britain, and situate in the midst of the south-westerly winds from the Atlantic, will render it of great value in framing the weather forecasts.

It is proposed to vest the property of the observatory in the Royal Society of Edinburgh as trustees; to entrust the charge and management of it to the Council of the Scottish Meteorological Society, and to make arrangements by which the Council of the Society will be strengthened by the addition of four members, namely, two gentlemen nominated by the Council of the Royal Society of Edinburgh, the President of the Royal Society of London, and the Chairman of Meteorological Council, London.

It is with the view of giving effect to the last suggestion, that I have been asked, as President of the Society, to request that you will allow us to have the honour of adding your name to the Council of the Scottish Meteorological Society.

Believe me, &c.

To Professor H. J. S. Smith. (Signed) RICHMOND AND GORDON.

The Chairman was requested to reply (Letter M.O. 1093) to the effect that while the Meteorological Council take great interest in the establishment of an observatory on Ben Nevis and recognise the great possible value of the observations to be obtained there, they do not see how their Chairman could usefully become a member of the Council of the Scottish Meteorological Society, as his attendance at its meetings would be virtually impossible, and he would thus be prevented from taking a part in its deliberations as to the establishment and working of the observatory.

Read—Letters 1110 and 1111 from the Royal Meteorological Institute of Holland, Utrecht, promising active co-operation with the Council in their proposed investigation of Atlantic weather.

The first draft of the Report of the Council for the year 1881–2 was considered.

Read—A memorandum from Captain Toynbee reporting that since the last meeting five logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. A. E. Barlow, Mr.C.H S.Tocque, 2nd Officer.	S.S. "Rosetta"	Dec. 22, 1881—April 9, 1882.	Galle, King George's Sound, Bombay, and home.	1881, p. 92.
Capt. H. Manning	S.S. "Seine"	Nov. 2, 1881—March 17, 1882.	London, Batavia, and home.	1880, p. 16.
Capt. W. Scott	Barque "Commewyne."	Oct. 28, 1881—April 17, 1882.	Glasgow to Surinam and home.	1881, p. 55.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

The Chairman reported (Minutes, p. 4)—That owing to the resignation of Mr. Dallas certain changes in the staff would become necessary, and he submitted the following list, which was approved. The changes to take effect on June 1.

CHANGES in OFFICE and INCREMENTS PROPOSED.

Entry.	Name.	Increase.	Present.	Proposed.	Hours.	Remarks.	Increase. (Calculated for a year.)	Decrease.
		£ s. d.	£ s. d.	£ s. d.			£ s. d.	£ s. d.
1872	*Dallas, W. L. - -	—	195 0 0	—	9	- - - -	—	195 0 0
1869	Francis, G. G. - A	15 0 0	180 0 0	195 0 0†	9	To be 4th Junior Clerk	15 0 0	—
1869	Bell, T. D. - A	13 6 8	160 0 0	173 6 8	8	To be 5th Junior Clerk	13 6 8	—
1874	Rigby, A. J. - A	34 0 0	2 16 0	A180 0 0†	9	To be 6th Junior Clerk Increment in 1884–5 (*two years*).	34 0 0 15 0 0	—
1875	Allingham, W. - -	0 2 6	2 16 0	2 18 6	8	- - - -	6 10 0	—
1875	Harries, H. - -	0 2 6	2 16 0	2 18 6	8	- - - -	6 10 0	—
1871	Sargeant, R. - -	0 2 6	2 7 3	2 9 9†	9	- - - -	6 10 0	—
1873	Thompson, C. H. -	0 2 6	2 6 0	2 8 6	8	- - - -	6 10 0	—
1874	Cobley, H. N. - -	0 2 6	2 2 0	2 4 6	8	- - - -	6 10 0	—
1876	Simpkins, A. R.- -	0 2 6	1 16 9	1 19 3	9	- - - -	6 10 0	—
1879	James, W. G. - -	0 2 6	1 16 8	1 19 2	8	Previous service -	6 10 0	—
1876	Aldridge, E. G.- -	0 2 6	1 16 8	1 19 2	8	- - - -	6 10 0	—
1879	Stevens, H. J. - -	0 5 0	1 10 0	1 15 0	8	- - - -	13 0 0	—
1877	Green, A. W. - -	0 2 0	1 2 8	1 4 8	8	- - - -	5 4 0	—
1876	Bell, A. H. - -	0 2 0	1 2 8	1 4 8	8	- - - -	5 4 0	—
1881	Allum, F. E. - -	0 2 0	0 18 0	1 0 0	8	- - - -	5 4 0	—
1881	Huntly, G. N. - -	0 2 0	0 12 0	0 14 0	8	- - - -	5 4 0	—
1881	Williams, J. T. - -	0 2 0	0 12 0	0 14 0	8	- - - -	5 4 0	—
1879	Bracey, C. A. - -	0 2 0	0 9 0	0 11 0	8	- - - -	5 4 0	—
1879	‡Parsons, W. H. - -	0 1 0	0 9 0	0 10 0	8	- - - -	2 12 0	—
1881	Brown, H. G. - -	0 1 0	0 7 0	0 8 0	8	- - - -	2 12 0	—
1881	Pycock, C. - -	0 1 0	0 7 0	0 8 0	8	- - - -	2 12 0	—
Griffith	Vacancy, Marine Branch	—	—	0 15 0	8	- - - -	39 0 0	—
McFarl	„ Land Observatory Room.	—	—	0 12 0	8	- - - -	31 14 0	—
Towers	„ Pantagraph Room	—	—	0 7 0	8	- - - -	18 4 0	—
	Mr. Dunn (left)- -	—	1 10 0	—	—	- - - -	—	78 0 0

A = Annual salary.
* Mr. Brodie to be 3rd Junior Clerk.
The maximum of 5th and 6th Junior Clerks raised 10*l.*, making the maximum salaries of 3rd, 4th, 5th, and 6th Junior Clerks 130*l.* for six hours' work. All other rises to be *absolutely for the time worked*, whether eight hours or nine hours. In future the arrangement of salary for six hours' work to be abolished, as far as relates to the clerks, and all salaries quoted to be for the time actually worked, viz., eight or nine hours.
† The additional allowances for evening service and Sunday telegraphy are not shown above. It is about $\frac{3}{10}$ths of nine hours' salary per clerk.
‡ To be paid from "Office" wages account after 27th May.

Read—A letter (No. 736) from Mr. Cullum applying for an increase of salary for H. Sugrue, his assistant, who had had no rise of salary for three years, and also for Healy, the attendant, who was giving great satisfaction, and was in receipt of only 12*s.* 6*d.* per week.

Resolved—That Mr. Sugrue's salary be raised from 5*l.* 10*s.* to 6*l.* per month, and Healy's wages from 12*s.* 6*d.* to 15*s.* per week, but that these increases should be respectively final.

SUBMITTED—The following STATEMENT respecting the RECORDS for August 1881, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

——	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—														
Action - - - - - - -	Direction. Good.	Velocity. Good.	Direction. Good	Velocity. Good	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good	Velocity. Good.	Direction. Good	Velocity. Good.
Records deficient, due to stoppage of clock -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes - -	0	0	0	0	0	0	0	0	*4 hrs.	*8 hrs.	5 hrs.	†37 hrs.	0	0
Orientation verified - - - - -	—	—	30th	—	13th	—	31st	—	10th	—	24th	—	13th	—
No. of errors discovered by subsidiaries -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	0	0	1	0	3	9	5	2	1	0	4	4
Result of 40 *Remeasurements :—*														
Greatest difference - - - -	1·0	1·0	0·0	1·0	1·0	1·0	2·0	2·0	1·0	1·0	1·0	1·0	1·0	2·0
Mean difference irrespective of sign - -	0·0	0·4	0·0	0·4	0·0	0·5	0·0	0·5	0·0	0·5	0·0	0·4	0·0	0·7
Residual difference (— Meteorological Office) -	0·0	0·0	0·0	0·0	0·0	+0·3	0·0	0·0	0·0	+0·1	0·0	0·0	0·0	+0·2
RAIN GAUGE :—														
Action - - - - - - -	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock -	0		0		0		0		0		0		0	
„ „ other causes - -	0		0		0		0		0		0		0	
Errors in tabulation - - - -	6		3		4		5		3		2		0	

BAROGRAPH :—							
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Do.	Bad.	Bad.	Do.	Do.	Indifferent.
Records deficient, due to stoppage of clock	0	0	1 hr.	0	0	0	0
„ „ failure of light	0	0	1 hr.	0	1 hr.	0	0
„ „ other causes	0	0	0	0	0	0	0
No. of errors discovered—							
In entry of standard	0	3	0	3	4	1	0
„ calculating residual correction	0	1	1	2	2	0	0
„ applying residual correction	5	2	0	2	1	4	2
„ subtraction in subsidiary tables	0	0	0	0	2	0	1
„ tabulation by subsidiaries	0	0	0	0	0	0	0
„ „ irregular differences	0	1	1	11	1	1	0
Result of 40 *Remeasurements* :—							
Greatest difference	·005	·007	·005	·011	·005	·006	·005
Mean difference irrespective of sign	·002	·002	·002	·003	·002	·002	·002
Residual difference (—Meteorological Office)	·000	+·001	·000	—·001	·000	·000	·000
Mean monthly difference between simultaneous Barograph and Barometer readings	·001	·002	·001	·001	·002	·001	·002

THERMOGRAPH :—														
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Do.		Bad.		Indifferent.		Indifferent.		Do.		Indifferent.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	0	0	9 hrs.	0	0	0	0	0	0	0	0
„ „ imperfectly moistened bulbs	—	2 hrs.	—	0	—	1	—	1	—	0	—	2	—	0
„ „ partially frozen bulbs	—	0	—	0	—	0	—	0	—	0	—	0	—	0
„ „ other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of errors discovered in entry of Standard	0	2	0	3	0	0	0	1	0	0	0	1	0	1
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ of subtraction in do. tables	2	1	0	0	0	0	3	9	1	4	0	0	1	2
„ „ detected under glass scale	1	0	2	1	1	4	11	10	1	0	2	0	7	2
Result of 40 *Remeasurements* :—														
Greatest difference	0·2	0·2	0·3	0·2	0·3	0·3	0·4	0·4	0·1	0·3	0·3	0·2	0·3	0·3
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1	0·1	0·2	0·1
Residual difference (—Meteorological Office)	0·0	0·0	—0·1	—0·1	+0·1	—0·1	+0·1	0·0	0·0	0·0	—0·1	0·0	—0 2	—0·1
Mean monthly difference between simultaneous Thermograph and Thermometer readings	0·2	0·2	0·2	0·2	0·1	0·1	0·2	0·2	0·2	0·2	0·1	0·1	0·1	0·2
No. of errors in maxima and minima	3	—	1	—	1	—	8	—	6	—	2	—	1	—

* Cleaning instrument.

† Defective action of clamp screw.

Read—The following report :—

REPORT on the RESULTS of a TENTATIVE REDUCTION of a YEAR'S ELECTROGRAMS at the KEW OBSERVATORY.

Although the Thomson electrograph has been in daily action at the Kew Observatory almost continuously since March 10th, 1874, no increase has been hitherto made by its means to our knowledge of the laws governing the changes of atmospheric electricity. This has been principally owing to the great difficulty which appeared to exist in deriving information from the curves, since, by reason of the rapid and almost constant fluctuations which they exhibit, tabulation with any degree of accuracy would seem to be almost an impossibility.

Whilst the method of utilising curves by tabulating was under consideration, we have been enabled, by the kindness of Mr. De La Rue, to take steps towards the determination of the exact scale value of the deflections of the instrument as recorded on the photographic sheet, and the results of certain experiments made at the laboratory in Charlotte Street have been accepted as the value of the scale at the date given above.

Full details respecting these experiments were embodied in a paper printed in Vol. XXVII., p. 356, of the Proceedings of the Royal Society.

Recently it occurred to me that it would be quite feasible to tabulate the electrograms rapidly and efficiently by means of a glass scale which should enable the computer to combine in one operation the two processes adopted by Professor Everett in his reduction of the Kew electrograms for the years June 1862—May 1864, as described in the Phil. Trans., Vol. CLVIII., pp. 347-361, and by means of which he should at once determine and measure the length of the mean ordinate of the curve for the hour.

Accepting, then, the scale value of the instrument already determined as a convenient one for working upon (although possibly from re-adjustment of the electrograph at the present date not absolutely correct), the scale represented in the annexed drawing was engraved on a plate of glass by Mr. Baker, first assistant in the Observatory.

It is constructed as follows :—

Two parallel vertical lines are drawn upon the glass, the interval separating them being made equal to the length of photographic curve produced by the instrument in one hour of mean solar time. The two vertical lines are intersected by a horizontal line at a point taken as zero of the scale and from this point scales are carried both upwards and downwards on each vertical line, each division of which represents a value of 10 volts of electromotive force, as indicated by the electrometer, the graduation above the zero representing negative, those below positive tension of atmospheric electricity.

Other vertical lines, parallel to and beyond the first-named ones, are placed at distances representing half an hour of time. The object of this being to allow of the curves being tabulated at odd hours by reference to the time breaks in the zero line which only indicates the even hours.

The operation of tabulating a curve has been conducted as follows :—

The observer having placed the curve so that the centre lies over the hour for which the tension is required, shifts it up and down until he succeeds in placing its zero line in such a position that he estimates it to represent the mean position of the trace for the interval contained between his two vertical scales. He then runs his eye down the scales until he meets the zero curve, when he reads off the division at which it intersects the scales. This is entered as the tension at the hour of observation, being really the estimated mean tension during the interval comprised between the half hour before and the half hour after the time recorded.

Care is always taken that the zero trace shall cut both vertical scales at the same point, and in this manner true horizontality of the zero line of the scale is always ensured.

The glass is then moved to the next or odd hour, the true position of which on the trace is determined by making the exterior vertical lines lie over the breaks in the curve made at the adjacent even hours.

Having experimentally tested the suitability of this means of tabulating for the purpose, the four months curves were measured, and results having been submitted to Professor Stokes, a grant of 5*l.* was made by the Council for the purpose of completing the tabulations for the year 1880. This has accordingly been performed by the aid of two of the Kew assistants, who have done the work in extra hours, and tables have been prepared showing the mean electrical tension for each hour of the day during the year, when the instrument was in good working order, and when it was not affected by thunderstorms, or other great electrical disturbances, sufficiently large as to prevent a fair estimation being made of the proper electrical condition of the atmosphere.

Copies of these tabulations are appended to this report together with an abstract showing the average electrical daily tension during the year, and a full-sized drawing of the glass scale employed for the measurement of the photographic traces.

Having received the kind permission of the Council to make use of the above tabulations, I briefly discussed them, and laid a short paper embodying my results before the meeting of the British Association in 1881. This paper the General Committee printed *in extenso* among the reports, and I beg respectfully to append a copy of it to this statement.

As regards the working of the Thomson electrograph, as fitted at Kew, I would venture to suggest to the Meteorological Council, as the result of experience, the advisability of effecting certain alterations in the instrument in the event of its being considered desirable to retain it in permanent use. At present many of its fittings are of a temporary make-shift character.

These alterations are as follows :—

1. The employment of a cistern of larger capacity than the present one, fitted with proper

appliances for straining the water to prevent choking the jet, and a regulating apparatus to ensure a constant rate of flow of the water.

2. A properly-fitted arrangement for heating the water in times of frost.

3. Proper means of connecting and fixing the conducting wires between the different parts of the apparatus, and of making earth contacts from time to time.

4. An improved suspension, or other controlling apparatus, which would enable the sensibility of the instrument to be reduced in times of great electrical disturbance.

5. A better arrangement of the illuminating apparatus and dark box, in order to prevent the occurrence of accidental photographic action on the curves.

6. The provision of a small constant battery, or other appliance, for the purpose of determining the scale value of the instrument from time to time.

Kew Observatory, May 1882. G. M. WHIPPLE.

116, *Victoria Street, June* 2, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. GALTON.	GENERAL STRACHEY.
PROFESSOR STOKES.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 17) were read and confirmed.

Read—The following letter (Minutes, May 4):—

CERTIFICATES.

M.O. 1127. Board of Trade (Marine Department), Whitehall Gardens, S.W., May 17, 1882.

SIR,

I AM directed by the Board of Trade to acknowledge the receipt of your letter of the 2nd instant, and in reply to request you to be so good as to thank the Meteorological Council for the trouble they have taken, and for their further offer of assistance in preparing instructions for the use of their examiners on the subject of cyclones or revolving storms.

The Board have decided to reprint for the use of their examiners and candidates for certificates of competency the papers headed "On the Use of the Barometer to Seamen," by Captain H. Toynbee, from pages 28 to 41 inclusive, of the Barometer Manual. As, however, it has been suggested that these extracts may require alterations and additions to meet the present views of meteorologists, and that the paragraphs marked with a cross in regard to the bearing of the centre of a storm should, if possible, be more definitely laid down for the guidance of the examiners, I am to request you to be good enough to move the Meteorological Council to cause the proposed extracts to be revised before they are sent forward to be printed.

I am, &c.

The Secretary, Meteorological Office, 116, Victoria Street, S.W. (Signed) THOMAS GRAY.

The Report of the Office for the year 1881–2 was again considered, and approved, and the Chairman was requested to forward it to the Royal Society.

Submitted—A copy of the Tables of Rainfall for the British Isles (366 stations), printed in accordance with the instructions of the Council (Minutes, 1881, p. 42).

Mr. Scott was instructed to submit a specimen of the chart to accompany the tables (Minutes, *loc. cit.*).

Read—The following letter:—

M.O. 1196. 62, Camden Square, London, N.W., May 26, 1882.

DEAR MR. SCOTT,

I HAVE the satisfaction of returning herewith the last sheet of the tables.

I may mention that the reduction of the means from three decimal places to two decimal places, and the calculation of the mean for the 15 years, which I was directed by the Council to undertake subsequent to the delivery of the work, completed in accordance with the original instructions, has given us about 250 hours of work beyond that agreed to in the original memorandum.

Yours, &c.

R. H. Scott, Esq., F.R.S. (Signed) G. J. SYMONS.

Resolved—That the sum of 12*l.* 10*s.* be paid to Mr. Symons for the extra work, as detailed in the foregoing letter.

Read—Letters 1184 and 1248 from Captain A. Noble (Minutes, p. 2) stating that the probable cost of the experiments with shells would be 20*l.*, and that the War Office had consented to the carrying out of the experiments at Shoeburyness.

The Secretary was instructed to inform Captain Noble that the Council would authorise his conducting the experiments at a cost not exceeding 20*l.*

The Secretary reported that he had forwarded copies of the forms for synchronous observations to the Admiralty, and had received the following reply:—

M.O. 1209.

SIR, Admiralty, May 26, 1882.

I HAVE laid before my Lords Commissioners of the Admiralty your letter of the 19th instant, enclosing copy of a memorandum respecting the proposed collection and discussion of synchronous meteorological observations in the North Atlantic Ocean, for thirteen months, commencing 1st August 1882, and ending 31st August 1883, and requesting the assistance of their Lordships in the furtherance of this undertaking.

2. My Lords desire me to request that you will state to the Meteorological Council that copies of the forms for recording observations, forwarded by you, have been issued to the Commanders-in-Chief at Portsmouth, at Devonport, and on the North American Station, as also to the Admiral in command of the Channel Squadron, for use on board any of Her Majesty's ships which may be ordered to cruize in the North Atlantic, or to make a passage between England and North America, or the West Indies.

I am, &c.

The Secretary to the Meteorological Council, (Signed) ROBERT HALL.
Meteorological Office, 116, Victoria Street, S.W.

Read—A letter from Captain Hoffmeyer, of Copenhagen, (Letter No. 1239) promising his co-operation in the proposed synoptic study of Atlantic weather, by the supply of materials.

Resolved—That the arrangements for carrying out this work be taken into consideration at next meeting.

Read—A memorandum from Captain Toynbee reporting that since the last meeting four logs had been received, two of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. George Shearer	"Corona" -	July 9, 1881—May 3, 1882.	San Francisco and home	1881, p. 35.
Capt. S. Griff Jones	"Hermine" -	Aug. 20, 1881—May 20, 1882.	Valparaiso, Taltal, and home.	1881, p. 35.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Read—A letter (No. 1157) from the Meteorological Society inquiring if the Council would allow 25*l.*, as usual, towards the cost of inspection of the Society's stations in the current year.—Authorised.

The Secretary was instructed to make arrangements for the issue of Hay Harvest Forecasts as in the last three years, and to send to the recipients of the forecasts copies of the Daily and the Weekly Weather Report during the continuance of the experiment.

Submitted—The following statements of work for May 1882:—

MARINE ROOM.

June 2, 1882.

Examined 12 new logs.

Cape of Good Hope District.

Cape Gales.—Compared revise of January and July letterpress.
Received from lithographer and examined revise of Plates VII. and VIII.

Barometer Means for Globe.

Means for November, North Atlantic, worked.
The charting of observations for February, May, and November, in Indian Ocean, commenced.

General.

Assisting in the discussion of Sea Temperatures for all Oceans.
Preparing list of shipowners, with the view of inviting their co-operation in Atlantic Weather observations.
Posting index of data in Ocean 10° Squares.
Instructing new clerk.

CHAS. HARDING.
HENRY TOYNBEE,
Marine Superintendent.

R. H. Scott, Esq.

PANTAGRAPH ROOM.

Copper Plates pantagraphed:—11 plates, Nos. 38 to 48, 1877.
Zinc Plates:—Barograms, 8 plates, Nos. 54 to 61, 1877; Thermograms, 8 plates, Nos. 54 to 61, 1877; Vapour Tension, 7 plates, Nos. 43 to 49, 1877; Anemograms, 9 plates, Nos. 63 to 71, 1877.
Photographic Curves are prepared to Plate 46 for barograms, and Plate 63 for thermograms.
The *Harmonic Analysis* of the 1873 temperature curves for Armagh and about half those for Glasgow has been completed.
I was occupied four days on subpœna in the Court of Queen's Bench, and for some time in connexion with the proposed reduction of sunshine traces and other matters.

R. H. Scott, Esq., F.R.S.

R. H. CURTIS.

EXAMINATION ROOM.

SIR,

June 2, 1882.

THE following curves and tabulations have been examined:—
August (1881): *Anemograms*, two stations. September (1881): *Thermograms*, five stations; *Barograms*, five stations; *Anemograms*, four stations. March (1882): *Anemograms*, one station. April (1882): *Thermograms*, one station.
The *Notes of Errors* and Monthly Reports thereon for *August*, have also been written out.

I am, &c.
T. E. ALLEN.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary, Meteorological Council.

The following cheques for May were drawn on the 31st of that month:—

		£ s. d.	£ s. d.
Administration:			
R. H. Scott, salary		- - -	66 13 4
J. S. Harding, jun.	Salaries and wages	27 15 6	
T. D. Bell		13 6 8	
J. S. Harding, sen.		*8 19 8	
			50 1 10
Pall Mall Coal Co., coals		- -	2 0 0
R. H. Curtis, attendance at Court		- -	2 2 0
R. Mustart, indexing minutes		- -	2 9 6
Pickford & Co., carriage of parcels		- -	3 6 8
Special Researches:			
G. J. Symons, rainfall values		- -	100 0 0
Land Meteorology:			
J. E. Cullum, salary		- -	16 13 4
Johnson, Matthey, and Co., nitrate of silver		- -	2 17 2
A. H. Bell, tabulating anemograms		- -	2 12 6
R. G. Canham	,,	- -	2 12 6
J. A. Curtis	,,	- -	3 10 0
J. T. Williams	,,	- -	1 15 0
R. H. Curtis	Discussion, &c. of Observations.	22 4 5	
J. A. Curtis		15 11 1	
T. E. Allen		15 11 1	
C. H. Thompson		*9 4 0	
E. G. Aldridge		*7 6 8	
			69 17 3
Carried forward		- -	£326 11 1

* Four weeks ending 27th May.

	£ s. d.	£ s. d.
Brought forward -	- -	326 11 1
Weather Telegraphy:		
Postmaster General, telegrams - -	- -	206 19 10
F. Gaster -	30 7 6	
W. L. Dallas - Preparation, &c. of Weather	19 15 1	
F. Brodie - Reports.	19 15 1	
G. G. Francis -	18 3 4	
		88 1 0
Ocean Meteorology:		
Capt. H. Toynbee - -	33 6 8	
Nav. Lieut. C. W. Baillie, R.N. Discussion, &c. of observations and	20 16 8	
R. Strachan - - - care of instru-	27 15 6	
C. Harding - - - ments.	22 4 5	
H. Harries - - -	*11 4 0	
		115 7 3
C. H. Gray, freight - - - -	2 19 10	
„ „ - - - -	1 14 6	
		4 14 4
J. J. Hicks, sling thermometers - -	- -	1 19 0
Pewtress & Co., printing - - -	- -	5 15 0
Spottiswoode & Co., advertisements - -	- -	4 10 0
J. Green, care of Bermuda anemometer -	- -	2 6 0
Hermann and Pfister, hair hygrometers -	- -	3 19 0
Miscellaneous:		
J. S. Harding, jun., petty cash - -	- -	60 0 0
Total -		£820 2 6

The following cheques were drawn on the dates specified for payment of weekly wages:—

6th May - - - - -	31 6 0
13th „ - - - - -	30 8 0
20th „ - - - - -	30 12 0
27th „ - - - - -	30 19 6
	£123 5 6

Reported—That the following boys had been engaged, the wages being for eight hours work each:—

H. J. Griffith (May 24) - -	15*s.* weekly.
R. Alford (May 29) - - -	12*s.* „
L. Powers (June 5) - - -	7*s.* „

116, *Victoria Street, June* 8, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 2) were read and confirmed.

The subject of the proposed Atlantic synoptic work was considered.

Submitted—The following memorandum prepared by Captain Toynbee at the request of the Chairman on certain points respecting the Atlantic synoptic work:—

I.—As to the mode of projection to be employed in the WORKING charts.

I do not think that the mode of projection would materially affect the work; I should therefore be inclined to use the projection which is likely to be employed in the *publication of results*, as by doing so we may avoid a second drawing of each chart.

I think it would be well to divide the working charts into five-degree squares by strong lines, and into one degree squares by very faint lines; with this provision I do not anticipate any difficulties in plotting the data.

II.—As to the mode of dealing with the forms when received.

The data on the forms would have to be prepared for plotting either by interpolation, if Greenwich time be preferred, or by pencilling out the set of observations which is not to be plotted, if local time be preferred.

In charting I should propose that the forms and charts for a given month be handed to the assistant charged with the work, and that he should commence with the chart for the first day of the month and plot on it all observations from the forms for that day, taking care to tick off from the form each day's observations after plotting them. He should then take up the chart for the second day of the month, and so on to the end.

III.—As to the scale to be adopted for the working charts.

It seems important that the charts should be as small as the requisite accuracy will allow, considering the number to be handled, and I think that if Mercator's projection be preferred, the scale (350 minutes of long. to the inch) now in use for barometer observations would answer the purpose. A chart on this scale from the equator to the highest latitude which the Council may determine to include would be a handy size.

If a conical projection be preferred, I think that a chart of about the size of that used by the Deutsche Seewarte in the charts recently submitted to the Council (Minutes 1881, p. 107, of which I append a pencil copy) would answer the purpose. Its scale is 350 miles to the inch.

IV.—As to the desirability of charting the observations for a limited time (say for the month of August or for the first fortnight of that month) both for Greenwich noon and for local noon, with the view of comparing the advantages offered by the two methods.

I think that such a comparative trial might be made without any great sacrifice of time; perhaps 10 days would suffice for a comparison of the two methods. I beg leave to refer to the subjoined statement of my reasons for preferring Greenwich noon. (Enclosure No. 1.)

V.—As to the best mode of making known as widely as possible the proposed system of observations in the N. Atlantic.

On this point I offer the following suggestions:—

(*a.*) To circulate as soon as possible draft letter No. 1, (Enclosure No. 2,) to the secretaries of large Shipping Companies, &c. &c., together with a copy of the "Notice," and also a copy of "Form No. 38."

(*b.*) Subject to the answers received to letter No. 1, to circulate the same Notice and Form to the same Companies, &c. about July 15th, together with another letter explaining that the time for commencing observations is approaching, and that the Council will be glad to know if arrangements for observing have been made, and asking what number of forms are required.

(*c.*) From the middle of July onwards to employ an intelligent officer in London and another in Liverpool (and, perhaps, also in other ports) to visit vessels in the docks, to see their captains, and to ascertain whether they have already undertaken to observe; if not, to induce them to do so, and to supply them with the number of forms they require. This officer to keep a record of the ships visited, the nature of the voyages, the captain's name and address. He might also carry an aneroid (properly set to a standard) and compare it with the ship's barometer, noting whether that was mercurial or aneroid; he might also ascertain if the ship had thermometers for noting the temperature of air and sea.

June 3, 1882. (Signed) HENRY TOYNBEE.

Enclosure No. 1.

Lt. 4 31. 1882.

REASONS for preferring to plot for GREENWICH NOON.

I. The fact that observations at Greenwich noon (or strictly speaking 0h. 8m. G.M.T.) will be available over Europe and at circumpolar stations, for comparison with the sea observations. It should be borne in mind that ships in the Royal Navy now record observations at 0h. 8m. G.M.T., so that no interpolation would be requisite in dealing with their observations, whereas for local noon their logs would have to be referred to. Again, the observations at American stations are at 0h. 8m. G.M.T., so that they would not be immediately comparable with observations at local noon. As it is supposed that one object of the discussion is to show whether or not the areas of low pressure which cross America come to Europe, this would be a disadvantage.

II. If we plot for local noon, the observations in 75° W. (on the western side of the Atlantic) will be taken five hours later than those on the eastern side of that ocean, and, as the wind-systems generally move to the eastward, this would be an element of confusion when studying the charts.

III. From 8 a.m. and noon observations (local time) we could interpolate very correctly for Greenwich noon, and with the aid of the extra records asked for when exceptional weather is experienced, the chart of one day could generally be connected with that of the next. If, however, a case should arise when it was thought advisable to plot a second chart within twenty-four hours, our data would show exactly what logs were needed, and we could borrow them.

Enclosure No. 2.

Letter No. 1.

Will you allow me to draw your attention to the enclosed notice and form which has been issued by the Meteorological Council?

You may perhaps have seen in the "Times" and other newspapers that the Meteorological Office is about to discuss the weather of the North Atlantic for a period of 13 months, from August the 1st, 1882, to September the 1st, 1883, and that they have requested all shipowners, captains, and officers of ships to aid in the work by contributing daily observations. The Council, as set forth in the instructions accompanying the form, are desirous of obtaining two observations a day, viz., at 8 a.m. and noon, local time, from all vessels in the North Atlantic, and they hope that the discussion of these observations may bring out results tending to throw light on the phenomena of Atlantic and British weather, by indicating the tracks and possibly the origin of the numerous storms which come to the coasts of Europe from that ocean.

The Council will be very grateful if you can see your way to assist them in the work by instructing the captains and officers with whom you are connected to take part in it. A supply of notices and forms, similar to the enclosed, will be sent on receiving an intimation from you of the number required. The Council will be glad if you can arrange to have the notice posted up in conspicuous places.

It is important to notice that the observations are to commence on August 1st, 1882.

1. It was agreed that the observations for one month should be plotted, both for Greenwich noon and for local noon, and it was suggested that preliminary trials should be made by Captain Toynbee, with observations already in the Office, with a view of ascertaining whether the same chart, or two different charts, should be used for the two plottings.

2. It was agreed that a conical projection should be used for the working charts.

The scale of the chart employed by the Deutsche Seewarte was considered too small, and it was agreed that Mr. Malby should prepare a chart, on a sheet of double elephant paper, including from 0° to 75° of North latitude, the central line being the meridian of 40° W.

3. The draft letter No. 1 was approved.

Submitted—The following estimate of the cost of calculating monthly hourly means for the observatories (Minutes, p. 15) :—

HOURLY MEANS.

I estimate that to calculate the monthly hourly means of the barometer and dry bulb and wet bulb thermometers for the 13 years, 1869 to 1881, will occupy the present staff of the room for about two years, excluding all other branches of work, but allowing for the time lost in receiving and storing returns, &c., and answering any queries, &c. that may arise.

It is supposed that the "Hourly Readings" would be used from 1874, and that for the five years preceding that date the barometer readings would have to be copied under their respective hours, while the thermometer readings would be cross-totted directly from the tabulation sheets.

To engage assistants specially for this work will cost the Office from 650*l.* to 700*l.*

R. H. Scott, Esq. J. A. CURTIS.

The Secretary was instructed to submit to the Council a statement of the rate of work performed by the Harmonic Analyser.

He was also instructed to submit a statement of the charges in the present year against the sum of 1,000*l.* assigned in the estimates for researches.

Submitted—A table of the mean values of the observations at the telegraphic reporting stations, for the month of January 1882, which had been issued with the Daily Weather Report.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting two logs had been received, one of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. G. J. Parson -	"Earnock" -	June 11, 1881—May 26, 1882.	Shanghai, Java, home -	1880, p. 109.

Mr. Scott was instructed to convey the best thanks of the Council to Captain Parson.

Reported—That the Ben Nevis observations had been recommenced (Letter 1242). The Secretary was instructed to make arrangements for the receipt of the observations by wire as early as possible in the day.

The Secretary was authorised to destroy the logs and other documents, already removed from the register by resolutions of the Meteorological Committee (Minutes 1868, p. 90; 1869, p. 5).

116, *Victoria Street, June* 22, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 8) were read and confirmed.

Reported—That letters had been received from the Chief Signal Office, Washington (Letter 1375), and from the Meteorological Institutes of Norway and of Portugal (Letters 1340 and 1403), promising to co-operate with the Council in their proposed investigation of Atlantic weather.

It was agreed that, early in July, the Board of Trade should be requested to consider the expediency of calling the attention of the mercantile shipping interest to the approaching commencement of the synoptic observations by a special circular, or in any other way they might think proper.

The employment of a special officer in London or Liverpool was sanctioned, if, when the time approaches, it should appear to the Chairman to be necessary.

The Secretary submitted the following reports, as directed at last meeting (Minutes, June 8).

LIST OF RESEARCHES AND EXPERIMENTS.

—	Amount chargeable to current year, as far as at present known.	Amount charged in previous years; Accounts not yet presented.
	£ s. d.	£ s. d.
Harmonic Analyser (*See* No. I.) Mr. Sheerman's salary	109 4 0	—
Proposed Calculation of Hourly Means (*See* No. I.)	—	—
Balloon Experiments (*See* No. II.)	0 15 0	—
Experiments on Thermometer Screens. These are being discussed (Minutes, 1881, p. 126.)	11 18 0	—
Bridled Anemometer (*See* No. III.)	10 0 0	—
Reduction of Kew Electrograms (Minutes, 1881, p. 113)	5 0 0	—
Experiments on Explosion of Shells (Minutes, 1882, p. 24)	20 0 0	—
Photography of Clouds (Postponed owing to Captain Abney's absence)	—	—
Nephoscope (in process of testing)	—	—
Cape Gales (Minutes, 29 Oct. 1880)	—	50 0 0
London Fog (In progress, *vide* Minutes, 1881, p. 94)	-	70 0 0
Hygrometry (Minutes, 1881, p. 84)	-	50 0 0
Terrestrial Radiation (In progress at Kew at Professor Tyndall's request, Minutes, 1881, pp. 107 and 113).	10 0 0	—
Actinometry	—	—
Ben Nevis Observations (In progress)	—	—
Sunshine Records, Cards, &c. (To be discussed)	8 15 0	—
Arctic Discussions (In progress)	30 0 0	—
Discussion of Kerguelen Observations (In progress)	—	—
Charges on Barometer Manual and Aids to Weather Study	5 2 5	—
Rain Observations, Mr. Symon's additional charges	12 10 0	—
Scilly Anemometer, Allowance to caretaker	6 10 0	—
Transfer from other Heads:		
Weather Telegraphy	50 0 0	—
Ocean Meteorology (As per Chairman's memorandum of June 1879.)	100 0 0	—

SIR, June 10, 1882.

I HAVE ascertained from my journal that the average rate at which Mr. Burton worked he Harmonic Analyser was as follows:—

To pass 12 months' dry-bulb curves, for one observatory, through the instrument - 11 days.

Mr. Sheerman has as yet only passed two complete sets of curves through the instrument, and owing to want of experience with the curves, and to some misadventures, they occupied him longer than any subsequent set will be likely to do. The third set (which he has nearly finished) will be completed in 12 days from its commencement, and I think this may be taken as a fair average rate of working for the instrument.

R. H. Scott, Esq., F.R.S.

R. H. CURTIS.

I. *Harmonic Analyser.*—The Secretary further stated that the work hitherto done by the harmonic analyser was the dry bulb temperatures for the years 1871–2 for all observatories, and the year 1873 for three observatories.

Resolved—That when the year 1873 is completed the year 1876 be next undertaken, and that Mr. H. S. Eaton be requested to place at the disposal of the Council his calculated results for that year (Quarterly Journal of the Meteorological Society, Vol. IV., p. 87), and that these be compared with the results obtained by means of the harmonic analyser for the same year.

II. *Balloon Experiments.*—Read, letters No. 1189 and 1240, from Captain Templer, stating that the cost of a balloon, for "captive" work, to carry instruments to the weight of 100 lbs., would be—for a cambric balloon (for coal gas) 65*l.*, and for a silk balloon (for hydrogen) 165*l.*

Mr. Scott was instructed (1) to obtain more detailed estimates from Captain Templer. (2) to obtain particulars as to the performance of Dr. Siemen's electrical thermograph, at present erected by the Meteorological Society on Boston Church Tower.

III. *The Bridled Anemometer.*—Resolved, that Professor Stokes be requested (1) to report on the best means of dealing with the records of the bridled anemometer already obtained, and on the best form of instrument to be employed in future; (2) on the advisability of undertaking experiments with the view of ascertaining the lateral extent of gusts of wind.

Read—Letter 1381, from Mr. Strachan, accompanying the MS. of Part III. of his "Contributions to the Meteorology of the Arctic Regions," and applying for a further grant for assistance in the work.

Resolved—That the sum of 30*l.* be placed at Mr. Strachan's disposal for the purpose (Minutes 1881, p. 22).

Read—A memorandum from Captain Toynbee, reporting that since the last meeting four logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. E. J. Blake -	"Tilkhurst" -	April 7, 1881—June 7, 1882.	Australia, California, and home.	1880, p. 96.
Capt. W. C. Crutchley, R.N.R. Log kept by Mr. T. Q. East.	S.S. "African" -	April 1—June 6, 1882.	To Cape of Good Hope and home.	1881, p. 134.
Capt. H. T. Bone -	S.S. "Sunbeam"	Aug. 20, 1881—April 5, 1882.	To Odessa and home, 2 voyages; Bombay and home, 1 voyage.	—

Mr. Scott was instructed to present the charts (O. 27) to Captain Bone, and to convey the best thanks of the Council to the other observers.

Submitted—The "Charts of Meteorological Data for the Ocean District adjacent to "the Cape of Good Hope."

The Secretary was instructed to have the records of sunshine in 1881 at all the stations engraved (Minutes, p. 9).

With reference to the subject of cumulative temperatures for the Weekly Weather Report (Minutes, p. 2) Mr. Galton submitted the following memorandum from Professor A. de Candolle:—

Vous me questionnez sur un sujet que j'ai toujours affectionné, mais que j'ai un peu abandonné, celui des sommes de température.

Depuis ce que j'ai publié en 1875 (Archives des Sciences physiques et naturelles, Aout et Sept. 1875) *sur la méthode des sommes de température*, il a paru deux mémoires importants d'un jeune assistant de l'observatoire de Pulkova, mort peu de temps après. Ils se trouvent dans les Mémoires de l'Académie des Sciences de St. Petersbourg, 1867 et 1869. Le nom de l'auteur est *Linsser*. Autant que j'ai pu comprendre son texte en allemand et ses calculs de mathématicien, il est arrivé à des formules trop compliquées pour être pratiques, mais on pourrait peut-être en deduire quelque bonne idée.

Un mémoire analogue, moins mathématique et dans lequel l'auteur traite de l'influence de l'humidité et de la température est: *Tschapsowitz, Untersuchungen über die Einwirkung der Wärme*, etc., 1 vol. in 8°., Leipzig, 1882. L'auteur a fait des expériences—mais sur un petite échelle. Il propose aussi des formules.

Beaucoup d'autres allemands ont traité ce sujet dans les laboratoires agricoles ou physiologiques.

La défaut de tous ces autres est de ne rien proposer qui permette de se servir des tableaux metéorologiques ordinaires. D'un autre côté les directeurs d'observatoires n'ont rien fait (si ce n'est peut-être à Montsouris près Paris) pour donner des sommes au lieu de moyennes.

Si votre comité parvient à quelque procédé commode pour exprimer les sommes au dessus de 0° C., + 1° C., + 2°, etc, ce sera au grande service rendu, car malgré les objections scientifiques de Sachs et autres les sommes auront toujours leur utilité. Elles ont bien peu d'inconvénients lorsqu'on compare la végétation d'année en année dans la *même* localité.

J'ai émis autrefois, dans ma Géographie botanique deux idées auxquelles on n'a pas fait attention et qui méritent peut-être qu'on s'en occupe.

1°. Pour mettre les observations anglaises en harmonie avec celles du continent, je proposais aux Anglais d'appeler *grads* les dégrés du thermomètre centigrade, en conservant *degree* pour les dégrés Fahrenheit. Les chiffres en grads seraient pour les savants et pour les étrangers, ceux en degrees pour le public anglais.

2°. Je demandais si l'on ne pourrait pas construire un pendule, aussi dilatable que possible, qui indiquerait par le nombre des oscillations la température moyenne cumulée. On m'a dit que les physiciens avaient fait quelque pendule semblable pour leurs expériences, mais je ne les connais pas, et on ne s'en est pas servi pour les applications à la météorologie.

Recevez, etc.

ALPH. DE CANDOLLE.

Mémoire à consulter, outre ceux indiqués dans la lettre.

R. Hult, Recherches sur les phénomênes périodiques des plantes. In 4°. Upsal, 1881, avec 3 planches.

(Rédigé en français.)

Genève, 16 Juin 1882. A. DE CANDOLLE.

The Secretary was instructed to procure the memoirs mentioned by Professor de Candolle; the subject to be considered after the Recess.

Submitted—A specimen map (in 4to) of the United Kingdom, showing the river basins (Minutes, June 8). The scale was considered too small, and the Secretary was instructed to issue a map in sections suitable for its appearance in 8vo size.

The Secretary was instructed to apply to H.R.H. the Admiral Superintendent of Naval Reserves, to the Trinity House, and the Commissioners of Irish Lights, requesting the continuance of the sea temperature observations after Sept. 30, 1882.

Submitted—A report by the Secretary on the storm of Oct. 14, 1822 (Minutes, 1881, p. 56). Approved.

Reported that the cash accounts for the nine months ended March 31, 1882, were audited by the Chairman and General Strachey on the 16th instant, and had been sent to the Treasury for the Audit Office. The receipts for the nine months, exclusive of a balance of 2,189*l.* 13*s.* 4*d.* on the 1st July 1881, amounted to 12,562*l.* 9*s.* 8*d.* The payments amounted to 12,949*l.* 0*s.* 9*d.*, leaving a balance of 1,803*l.* 2*s.* 3*d.* in hand and at the Bank on the 1st April 1882.

Submitted—The following reports.

SIR,

I HAVE the honour to report, for the information of the Council, on the work which has been done, for the quarter ending 30th June 1882.

Many additions have been made to the Sea Surface Temperature Charts in high north and south latitudes, and the investigation has been extended to the Mediterranean Sea. The charts are now in the hands of the engraver. The Introduction and Remarks to accompany them are in progress: these will, however, require revision.

During the temporary absence since 5th June of Captain Toynbee on leave, I have discharged the duties of Marine Superintendent.

I am, &c.

C. W. BAILLIE,
Nav. Lieutenant, R.N.

R. H. Scott, Esq.,
M.A., F.R.S., &c.

REPORTS of WORK for JUNE.

MARINE ROOM.

Examined 7 new logs.

Cape of Good Hope District.

Cape Gales.—Various work in connexion with Revise.

Barometer Means for all Oceans.

Observations from Office logs plotted and means partially worked for August, North Atlantic, and May, Indian Ocean.

Indian Ocean Charts for February, August, and November in progress.

Pacific Chart for May commenced.

Office

General.

Assistance given in the discussion of Sea Temperatures for all Oceans.

Making list of owners of British registered vessels and others, and forwarding to same circular letter and specimen forms, asking for co-operation in the system of weather observations in the North Atlantic for 13 months, commencing 1st August 1882.

Instructing Mr. Dallas in marine work prior to his taking up the duties of scientific assistant to the Meteorological Reporter to the Government of India. The month's instruction given entirely by the senior clerk of the room.

Instructing new clerk.

CHARLES HARDING.
July 7, 1882.

The Marine Superintendent,
H. T.

PANTAGRAPH ROOM.

June 30, 1882.

Copper Plates pantagraphed:—3 plates, Nos. 49 to 51, 1877.

Zinc Plates.—Barograms, 5 plates, Nos. 62 to 66, 1877; Thermograms, 6 plates, Nos. 62 to 67, 1877; Vapour tension, 11 plates, Nos. 50 to 60, 1877; Anemograms, 2 plates, Nos. 72 to 73, 1877; Rain curves, 7 plates, Nos. 55 to 61, 1877.

Photographic Curves are prepared to Plate 69 in the case of the barograms; the thermograms are not in advance of the zinc plates.

The Harmonic Analysis of the temperature curves for 1873 has been carried as far as Falmouth, the curves for which station are about one third done.

A great deal of time has been occupied in instructing L. Powers in the use of Wagner's Pantagraph, and the changes consequent upon the transfer of Mr. Rigby to the Telegraph Room have considerably retarded the progress of the work generally.

R. H. Scott, Esq., F.R.S. — R. H. CURTIS.

EXAMINATION ROOM.

SIR, July 1, 1882.

The following curves and tabulations have been examined:—September (1881): *Barograms*, one station; *Anemograms*, three stations.

April (1882): *Thermograms*, one station; *Barograms*, two stations; *Anemograms*, two stations.

May (1882): *Thermograms*, one station; *Barograms*, one station: *Anemograms*, two stations.

The *Notes of Errors* and Monthly Report thereon for *September* and the *Notes of Errors* of Valencia and Armagh for *March* 1882 have also been written out.

During the month I was absent from the Office on 11 days and Mr. Aldridge was absent on two days.

I am, &c.
T. E. ALLEN.

R. H. Scott, Esq., M.A., F.R.S.,
Secretary, Meteorological Council.

The following cheques for June were drawn on the 30th of that month:—

	£	s.	d.	£	s.	d.
Administration:						
R. H. Scott, salary	-		-	66	13	4
J. S. Harding, jun. } Salaries and wages	27	15	6			
T. D. Bell }	14	8	10			
J. S. Harding, sen. }	*8	19	8			
				51	4	0
C. W. Jacques, rent (No. 116)	133	13	0			
„ „ (No. 113)	18	0	6			
				151	13	6
Pall Mall Coal Company, coals	-		-	10	16	0
Special Researches and Experiments:						
G. J. Symons, rainfall observations	-		-	12	10	0
W. Thomas, care of Scilly anemometer	-		-	1	13	7
H. Williams, care of "Bridled" anemometer	-		-	2	11	0
Land Meteorology:						
C. Niven, Aberdeen observatory	-		-	68	16	10
Armagh observatory, allowances	46	19	0			
„ „ expenses	10	0	7			
				56	19	7
Carried forward	-		-	£422	17	10

* Four weeks ending 24th June.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	422	17	10
Land Meteorology—*cont.*						
W. L. Fox, Falmouth Observatory - -	-		-	72	4	11
R. Grant, Glasgow Observatory - -	-		-	68	8	4
H. Williams, Holyhead - - -	-		-	2	13	4
Kew Committee, allowance for quarter -	-		-	100	0	0
G. H. Aird, Seaham - - - -	-		-	2	16	3
S. J. Perry, Stonyhurst - - -	-		-	56	7	1
J. E. Cullum, salary - - - -	16	13	4			
„ (expenses) - - -	46	12	4			
				63	5	8
G. T. Watson, Yarmouth - - - -	-		-	4	0	6
C. E. Burton, calculating means - -	-		-	6	0	0
Meteorological Society, observations - -	-		-	27	10	0
J. O'Driscoll, rent at Valencia - - -	-		-	25	0	6
R. H. Curtis -	22	4	5			
J. A. Curtis -	15	11	1			
T. E. Allen - } Discussion, &c. of observations	15	11	1			
C. H. Thompson	*9	14	0			
E. G. Aldridge -	*7	16	8			
				70	17	3
Weather Information and Forecasts:						
J. W. Mayes, Ardrossan - - -	-		-	1	0	0
Postmaster, Bundoran - - -	-		-	1	8	0
H. Todd, Cambridge - - - -	-		-	4	11	0
Postmaster, Cliffony - - - -	-		-	1	1	0
H. Mohn, Christiania - - - -	-		-	5	10	0
T. MacGowan, Donaghadee - - -	-		-	0	14	0
J. Costello, Dover - - - -	-		-	3	18	6
W. Brand, Dunrossness - - -	-		-	3	18	6
Postmaster „ - - -	-		-	1	8	0
W. Foster, Hawes Junction - - -	-		-	3	18	3
J. Tilston, Holyhead - - - -	-		-	3	19	0
G. G. Appleton, Hurst Castle - - -	-		-	3	18	7
Postmaster, Inverness - - - -	-		-	1	6	0
J. Fisher, Jersey - - - -	-		-	4	5	6
Postmaster, Killarney - - - -	-		-	1	1	0
J. Hutchison, Leith - - - -	-		-	0	13	0
Postmaster, Lerwick - - - -	-		-	1	10	0
W. Berridge, Loughborough - - -	-		-	2	6	4
K. Kerr, Mullaghmore - - - -	-		-	9	15	9
W. D. Penny, Nairn - - - -	-		-	4	4	6
M. Mackintosh „ - - - -	-		-	0	13	0
W. Wickham, Oxford - - - -	-		-	3	12	6
G. Phillips, Parsonstown - - -	-		-	3	7	6
J. John, Prawle Point - - - -	-		-	3	5	0
G. Blake, St. Ann's Head - - -	-		-	4	1	3
W. Thomas, Scilly - - - -	-		-	4	18	11
R. W. Scaddan, Scilly - - - -	-		-	0	14	0
J. B. Smith, Spurn - - - -	-		-	3	5	6
A. M. Macdonald, Stornoway - - -	-		-	5	11	11
Postmaster, Stornoway - - -	-		-	1	6	0
„ Valencia - - - -	-		-	0	14	0
J. Sinclair, Wick - - - -	-		-	3	5	0
Postmaster „ - - - -	-		-	1	6	0
G. T. Watson, Yarmouth - - -	-		-	4	7	0
A. Guy, York - - - - -	-		-	3	18	0
Carried forward -			-	£1,026	14	2

* Four weeks ending 24th June.

		£	s.	d.	£	s.	d.
	Brought forward -	-		-	1,026	14	2
Weather Information and Forecasts—*cont.*							
F. Gaster -	Preparation, &c. of Daily Weather Reports.	30	12	8			
W. L. Dallas -		16	5	6			
F. Brodie -		19	13	0			
G. G. Francis -		19	18	8			
A. J. Rigby -		15	0	0			
R. Sargeant -		*12	1	9			
					113	11	1
Postmaster General, telegrams - - -		-		-	162	13	9
Inspections:							
A. Buchan, salary - - - -		37	10	0			
„ expenses - - - -		3	3	0			
					40	13	0
W. C. Ley, salary - - - -		-		-	37	10	0
Meteorological Society, contribution - -		-		-	25	0	0
Ocean Meteorology:							
Captain H. Toynbee - -	Discussion &c. of observations, and care of instruments.	33	6	8			
Nav. Lieut. C. W. Baillie, R.N.		20	16	8			
R. Strachan - - -		27	15	6			
C. Harding - - -		22	4	5			
H. Harries - - -		*11	14	0			
					115	17	3
P. Adie, repairing "A" barometers - -		12	19	6			
„ „ "B. T." „ - -		4	15	0			
					17	14	6
Negretti & Zambra, "A" instruments -		49	8	6			
„ „ "B. T." „ - -		45	4	0			
					94	12	6
J. H. Woodstock, packing cases - -		-		-	4	19	0
Miscellaneous:							
P. Adie, commissions - - - -		-		-	14	0	0
R. J. Lecky, commissions - - -		-		-	23	0	0
Negretti & Zambra, commissions - -		-		-	58	10	0
J. S. Harding, jun., petty cash - -		-		-	60	0	0
	Total -				£1,794	15	3

The following cheques for weekly salaries were drawn on the dates specified:—

June 2nd - - - - - - -	27	5	3
„ 10th - - - - - - -	30	10	9
„ 17th - - - - - - -	28	8	9
„ 24th - - - - - - -	29	0	9
„ 30th - - - - - - -	29	0	9
	£144	6	3

* Four weeks ending 24th June.

SUBMITTED—The following STATEMENT respecting the RECORDS for September 1881, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868, and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH:—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action														
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	0	*2 hrs.	*3 hrs.	0	0	1 hr.	1 hr.	0	0	0	1 hr.	0	0
Orientation verified	30th	—	27th	—	22nd	—	—	—	9th	—	28th	—	13th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	0	1	4	1	0	8	1	2	1	3	0	0	6
Result of 40 *Remeasurements*:—														
Greatest difference	1·0	1·0	0·0	1·0	0·0	1·0	1·0	1·0	1·0	1·0	0·0	1·0	0·0	2·0
Mean difference irrespective of sign	0·0	0·4	0·0	0·5	0·0	0·4	0·0	0·5	0·0	0·1	0·0	0·3	0·0	0·6
Residual difference (—Meteorological Office)	0·0	0·0	0·0	+0·1	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	+0·2

RAIN GAUGE:—							
Action	Good.	Good.	Indifferent.	Good.	Good.	Good.	Indifferent.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	0	0	0
Errors in tabulation	0	2	7	1	1	1	1

BAROGRAPH :—

Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Do.	Bad.	Do.	Do.	Do.	Bad.
Records deficient, due to stoppage of clock	0		0	12 hrs.	0	0	0
„ „ failure of light	0	0	2 hrs.	1 hr.	0	0	0
„ „ other causes	†1 hr. *2 hrs.	0	0	*1 hr.	‡1 hr.	§17 hrs. * 1hr.	‖ 35 hrs.
No. of errors discovered—							
In entry of standard	1	0	0	5	7	1	0
„ calculating residual correction	0	2	0	0	0	1	0
„ applying residual correction	1	0	0	5	5	2	1
„ subtraction in subsidiary tables	0	0	0	5	0	0	0
„ tabulation by subsidiaries	0	0	0	0	0	0	0
„ „ irregular differences	0	0	6	2	0	0	0
Result of 40 *Remeasurements :—*							
Greatest difference	·005	·006	·013	·008	·005	·006	·006
Mean difference irrespective of sign	·002	·002	·002	·003	·002	·002	·002
Residual difference (—Meteorological Office)	·000	·000	—·001	·000	·000	·000	—·001
Mean monthly difference between simultaneous barograph and barometer readings	·002	·002	·001	·001	·001	·001	·002

THERMOGRAPH :—

Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Do.		Bad.		Do.		Do.		Do.		Indifferent.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	1 hr.	1 hr.	0	0	0	0	2 hrs.	2 hrs.	0	0
„ „ failure of light	0	0	0	0	0	2 hrs.	0	0	0	0	0	0	1 hr.	0
„ „ imperfectly moistened bulbs	—	0	—	0	—	2 hrs.	—	4 hrs.	—	1 hr.	—	1 hr.	—	0
„ „ partially frozen bulbs	—	0	—	0	—	0	—	0	—	0	—	0	—	0
„ „ other causes	*3 hrs.	*3 hrs.	0	0	0	0	*2 hrs.	*2 hrs.	0	*1 hr.	0	0	0	0
No. of errors discovered in entry of standard	0	6	0	0	1	1	1	5	0	1	1	2	0	0
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ of subtraction in do. tables	0	0	0	0	0	0	6	4	3	1	1	0	2	0
„ „ detected under glass scale	1	0	12	0	0	6	31	18	1	0	1	1	1	2
Result of 40 *Remeasurements :—*														
Greatest difference	0·2	0·1	0·3	0·2	0·2	0·4	0·4	0·4	0·2	0·2	0·2	0·2	0·3	0·2
Mean difference irrespective of sign	0·1	0·0	0·1	0·1	0·1	0·2	0·2	0·2	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (—Meteorological Office)	—0·1	0·0	—0·1	—0·1	0·0	—0·2	+0·1	—0·2	0·0	0·0	—0·1	0·0	—0·1	—0·1
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·1	0·2	0·2	0·1	0·1	0·2	0·2	0·1	0·2	0·1	0·1	0·1	0·3
No. of errors in maxima and minima	0	—	8	—	2	—	7	—	0	—	3	—	6	—

* Examination of Instrument. † Light on binding rods. ‡ Fingermarked. § Imperfect action of shutter. ‖ Photographic imperfections.

116, *Victoria Street, October* 25, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	MR. GALTON.
PROFESSOR STOKES.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 22) were read and confirmed.

Read—The following letters :—

M.O. 1625.

SIR, Royal Society, 8th July 1882.

HEREWITH I forward copy of a letter, 10217/82, addressed to myself by direction of the Lords of the Treasury, and of an official report (8484) by the Registrar-General of Scotland. Their point is: Can the Meteorological Council undertake to furnish the Registrar-General of Scotland with weekly, monthly, and quarterly meteorological tables?

Will you, at a convenient opportunity, lay the question before the Meteorological Council, and acquaint me with their decision, for the information of the Council of the Royal Society?

I am, &c.

(Signed) W. SPOTTISWOODE,

The Secretary of the Meteorological Council. President.

10217/82—M.O. 1625.

SIR, Treasury Chambers, 27th June 1882.

I AM directed by the Lords Commissioners of Her Majesty's Treasury to acquaint you that since 1858 the Astronomer Royal for Scotland, working in concert with the Meteorological Society for Scotland, has prepared certain meteorological tables to be published in the periodical reports of the Registrar-General for Scotland. The details of this arrangement are described in a report of the Registrar-General for Scotland dated the 9th instant, of which a copy is enclosed, together with samples of the weekly, monthly, and quarterly reports therein referred to. My Lords have now under consideration an arrangement for transferring the Royal Observatory at Edinburgh to the Edinburgh University, and in connexion therewith, they wish to relieve the staff of the Observatory of the duty of preparing for the Registrar-General for Scotland the meteorological tables above referred to. My Lords would be glad to know whether the Meteorological Council would be able to supply the Registrar-General for Scotland with weekly, monthly, and quarterly meteorological tables similar to those now published by him, without requiring any addition to be made to their present annual grant, which amounts for the current financial year to 15,300*l.*

(Signed) R. R. W. LINGEN.

The President of the Royal Society.

No. 8484.—M.O. 1625.

SIR, Registrar-General's Office, Edinburgh, 9th June 1882.

I HAVE the honour to acknowledge the receipt of your letter of the 13th ult. requesting me to report, for the information of the Lords Commissioners of Her Majesty's Treasury, upon the meteorological work done for my Department by the staff of the Edinburgh Observatory, with special reference to the Report of the Commissioners, of whom I was one, appointed in 1876 to inquire into the state of the Royal Observatory here. Attention is called in your letter to the 24th paragraph of that Report, in which we observe that under the existing arrangement for tabulating the meteorological observations a large share of the time of the Observatory staff is withdrawn from the legitimate duties of such an institution, and on that ground we recommended that they should be relieved from this work. In my capacity of one of the Commissioners of 1876, as well as in my present capacity of Registrar-General, I have every reason to express my entire satisfaction with the manner in which the work has been done, and consequently the only matter now to be dealt with is the question of how to get the work done by some other agency than that of the Observatory staff. A short statement of the way in which the arrangements took their present shape, and of the exact nature and extent of the work, may assist my Lords of the Treasury in coming to a conclusion upon this question. The Meteorological Society for Scotland was instituted in 1855, almost contemporaneously with the institution of the Office of Registrar-General for Scotland, and arrangements were then made under which the Society furnished to the Registrar-General statistics of weather and temperature to be used in connexion with the mortality tables, for the purpose of illustrating the effects of atmospheric phenomena upon the death-rate. The institution of the Meteorological Society was in great measure due to the energy of Dr. Stark, who became its first Secretary, and he also received the appointment of Superintendent of Statistics

in the office of the Registrar-General about the same time. The original subscriptions for the foundation of a Meteorological Society in order to establish a system of meteorological observations at stations distributed over Scotland were only undertaken for a period of three years terminating in June 1858, and the Society accordingly in 1858 intimated with much regret to Dr. Stark that his services as Secretary would not be required after that date, and notified to the Registrar-General that he must not expect to receive any further meteorological statistics from the Society for the use of his department. My predecessor in this office thereupon brought the matter before the Treasury by letter of the 18th May 1858 in which he concluded with a suggestion that he might be allowed to make payments for meteorological information and returns at rates to be sanctioned by the Treasury, in which case he indicated his belief that the existing difficulties would be overcome. The matter evidently received very careful attention by the Home Office and the Board of Trade, as well as by the Treasury, and on the 13th July 1858 an intimation was made to my predecessor, through the medium of the Home Office, stating that, though there were objections to the proposal presented to the Treasury by himself and the Meteorological Society, it was hoped that the object in view might be attained in another form. In England it was stated the meteorological observations made in different places were revised and classified under the directions of the Astronomer Royal and the results furnished by him to the Registrar General for publication, and consequently a communication had been addressed by the Government to the Astronomer Royal for Scotland, inquiring whether he could undertake the same duty in reference to Scotland. The Home Secretary's letter concluded by indicating the opinion that the service would thus devolve upon the public offices to whom it properly belonged, and from whose intervention much advantage might be expected. Under these circumstances the arrangement took shape which has subsisted to the present day, for supplying this office with the meteorological tables which are inserted in my periodical reports. Under this arrangement the various meteorological stations throughout Scotland from which returns are received continue to be under the direct superintendence of the Meteorological Society. The returns are transmitted in the first instance to the Society's office in Edinburgh, where they are looked over by the Secretary, Mr. Buchan, whose acquirements as a meteorologist, and zeal in the discharge of his duties, are well known to all who are interested in that science, and afford a guarantee that all possible care will be taken to keep the observers right. The returns of observations are thereafter passed on to the Astronomer Royal to be reduced and tabulated for use in my periodical reports. The tables published by me may be shortly described as follows:—(1.) Weekly Tables of Temperature and Rainfall in the eight principal towns of Scotland; (2.) Monthly Tables of the Observations of the Barometer, Thermometer, and Hygrometer, and also of Rainfall and Wind in the eight principal towns of Scotland; (3.) Quarterly Tables of all the above-mentioned elements for all the Observing Stations in Scotland, 55 in number. Of these tables, the first-mentioned, viz., the Weekly Tables of Temperature and Rainfall, are furnished to me directly by the Secretary of the Meteorological Society, as they must be supplied promptly in order to be in time for my weekly reports, and they are of a simple character not involving any labour of reduction. The Monthly and Quarterly Tables include a greater number of elements, and the latter a much greater number of observations, viz., those from 55 stations, and the labour of reduction is considerable. As before stated, the Secretary of the Meteorolegical Society checks the returns from the stations as far as he can in the first instance. But, in the course of the work of tabulation, results apparently abnormal may be brought out; and, when such is the case, the Astronomer calls attention to it, and an investigation is made in order to ascertain whether it arises from any error of the observers or of their instruments, or whether it truly represents an unusual meteorological phenomenon. The foregoing statement will, I hope, sufficiently explain the nature of the work, and the conditions under which it is carried on, and so place my Lords of the Treasury in a position to determine as to the best arrangement for carrying it on in future, assuming that the Observatory staff is to be relieved of that part of the duty now discharged by it. I concur in the opinion indicated in your letter that the cost of the work in question, in so far as borne by the Government, would be properly charged against the vote for the Meteorological Council. With respect to the working arrangements, I would propose that the work now done by the Observatory staff under the superintendence of the Astronomer should in future be done under the superintendence of the Scottish Meteorological Society or of their Secretary, Mr. Buchan. As my Lords are aware, the Astronomer now receives an annual allowance of 100*l.*, out of which he pays the computers by piece-work for the compilation of the tables, and such balance as remains forms his own remuneration, and, knowing the amount of personal attention which he gives to the work, his services are, I think, secured at a most moderate cost. The second observer is remunerated by an addition to his salary of 10*l.*, rising by increments to 50*l.* The total maximum cost of the work is thus 150*l.* a year. If my Lords of the Treasury should see their way to direct that a sum, to be definitely settled after further consideration, not exceeding 150*l.* a year, should be paid out of the vote for the Meteorological Council to Mr. Buchan, the Secretary of the Scottish Meteorological Society, to cover the cost of the meteorological work hitherto performed by the Observatory staff for the Registrar-General, I have no doubt that a satisfactory arrangement for the transference of the duties could be easily effected, and I should be prepared, if required, to report further as to the settlement of details. If my Lords should see fit to sanction any arrangement of this nature, it should be made revocable at the pleasure of the Treasury with reasonable notice, and it should be understood that it will be made matter for re-consideration on Mr. Buchan ceasing to be Secretary to the Scottish Meteorological Society. In any arrangement made, it is necessary to keep in view that, unless the work is done in Edinburgh, delays in transmission of returns and in correspondence as to corrections, would probably sometimes render it impossible to furnish the tables in time for

my reports. It is also to be observed that the work must be carried on in concert with the Scottish Meteorological Society, by whom the observing stations are superintended, to whom the returns from these stations are in the first instance made, and to whom the returns are re-transmitted from the Observatory in order to be filed as part of the records of the Society after the tables for my reports have been prepared.

(Signed) STAIR AGNEW,
Registrar-General.

The Secretary to the Treasury, London.

The Secretary was instructed to forward to the President of the Royal Society the following letter (No. 2306) :—

I AM instructed to inform you that the Meteorological Council are prepared to undertake the preparation of weekly, monthly, and quarterly tables for the Registrar-General of Scotland without any charge to the Government, provided that the observations on which these tables have hitherto been founded be placed at their disposal.

The weekly returns for the eight principal towns would be most conveniently prepared in Scotland. The reduction of the quarterly and monthly tables would, as a matter of course, be carried out in the Office.

This is the arrangement adopted by the Council in supplying similar returns to the Registrar-General of Ireland, and it has worked satisfactorily.

Read—The following letter :—

GENTLEMEN, Armagh, October 18, 1882.

As I understand that there is to be a meeting of the Council within a few days, I take this, the earliest opportunity since my arrival here, to draw your attention to the anomalous relation of this observatory to the Council. Although I am responsible for the work done here and have to superintend it and to conduct the correspondence with the Meteorological Office, I receive no remuneration whatever. I am sure it would be far more satisfactory if the Armagh Observatory was placed on the same footing as the other first-class stations, so that I would receive a certain sum annually and manage the accounts entirely. In fixing this sum I hope the Council would have regard to the necessity of allowing me, as Superintendent, some remuneration, and it would also give me much pleasure if the Council would take into consideration the long time Mr. Call has performed his duties here, as, I believe, to the perfect satisfaction of the late director, Dr. Robinson.

I beg to enclose a letter from Mr. Call to myself, asking me to forward an application (also enclosed) to the Council [not printed here].

I am, &c.
(Signed) J. L. E. DREYER.

To the Meteorological Council.

The Secretary reported that the annual allowances to the observatories are at present as follows :—

Falmouth	£290
Aberdeen and Glasgow	275
Armagh	250
Stonyhurst	225

Resolved—I. That the annual grant to Armagh Observatory be increased to 275*l.* so as to equalize it with the grants to Aberdeen and Glasgow, the augmentation to date from July 1, 1882, and that Dr. Dreyer be informed that it is beyond the province of the Council to interfere with the arrangements made by him for the remuneration of his assistants.

II. That a special grant of 25*l.* be made to Mr. Call in consideration of the increased responsibility thrown on him in the interval between the decease of Dr. Robinson and the arrival of Dr. Dreyer at the observatory.

III. That Dr. Dreyer be informed that the question of continuing the observatory is under the consideration of the Council.

Read—Letter 2340 from Mr. W. L. Fox, of Falmouth, stating (1) that the Polytechnic Society were prepared to agree to a reduction of 40*l.* in the annual grant to the observatory, to commence April 1, 1883; (2) that Mr. Squire had retired from the superintendence of the observatory on the 21st of July, and had been succeeded by Mr. E. Kitto (Minutes, p. 9).

With reference to the proposed meteorological atlas of the British Isles (Minutes, 1881, p. 138), Mr. Scott reported that the monthly temperature and pressure charts prepared by direction of the Council were completed.

Resolved—That the temperature and pressure charts be forwarded to the engraver, after having been submitted to General Strachey for final revision.

Sir F. Evans was requested to have an experimental rainfall map prepared from Mr. Symons' tables (Minutes, 1881, p. 42), with the view of adding a rain chart of the British Isles to the proposed meteorological atlas.

Mr. Scott drew the attention of the Council to the monthly charts of pressure and temperature for the British Isles, for the 24 years ending 1880, prepared by Mr. Buchan (Minutes, 1878, p. 35), and published (during the Recess) by the Scottish Meteorological Society in Part LXIV. of their Journal.

Read—A report by Mr. Gaster and Mr. Marriott (Letter 2380) showing a satisfactory agreement between the maps prepared in the Office and those of Mr. Buchan, the two discussions having been entirely independent of each other.

Submitted—A map of the United Kingdom in four sheets, 8vo, showing the river basins and the position of the 366 stations from which returns have been printed in the forthcoming rainfall tables of the British Isles (Minutes, p. 23).—Approved.

Submitted.—Mr. Whipple's report on the comparison at Kew of the Russian and other thermometer screens (Minutes, 1881, p. 126) (Letter 1796). The Secretary was instructed to print it as an appendix to the Quarterly Weather Report.

Read—A memorandum from Captain Toynbee reporting that since the last meeting 54 logs had been received, 42 of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Comm. P. Aldrich, R.N., Lieut. E. J. W. Slade, R.N.	H.M.S. "Fawn"	Sept. 25, 1881—May 30, 1882.	Surveying East Coast of Africa.	1881, p. 92.
Capt. A. E. Barlow	S.S. "Rosetta"	May 18—Sept. 18, 1882.	London to China and home, viâ Suez.	1882, p. 18.
Capt. W. Barron -	S.S. "Sultan" -	Feb. 20—June 23, 1882.	Hull and Hamburg, 9 voyages.	1881, p. 134.
Capt. A. E. Bell -	S.S. "Tamar" -	Jan. 24—June 11, 1882.	Rio Janeiro and home, 2 voyages.	—
Capt. J. A. Broadfoot.	S.S. "Cipero" -	May 27—July 25, 1882.	Glasgow, Trinidad, Demerara, and home.	—
Capt. A. J. Brown -	Barque "Arran"	Feb. 23—July 8, 1882.	London to Diego Garcia	1881, p. 55.
Capt. J. Buchan -	Barque "Coppename."	April 28—Oct. 15, 1882.	Glasgow, Surinam, Nickerie, and home.	1882, p. 3.
Capt. A. Campbell -	S.S. "Ethiopia"	March 18—Aug. 15, 1882.	Glasgow to New York (4 voyages).	1880, p. 128.
Capt. J. Campbell -	"Hope" -	Jan. 28—June 8, 1882.	Liverpool and Arcaju -	1880, p. 16.
Lieut. A. Carpenter, R.N., commanding, Lieut. A. Balfour, R.N.	H.M.S. "Magpie."	Jan. 1—April 30, 1882.	Surveying in China and Japan Seas.	1881, p. 138.
Capt. W. C. Crutchley, R.N.R.	S.S. "African"-	July 8—Sept. 13, 1882.	Plymouth, Cape, and home.	1882, p. 31.
Capt. L. C. Dart -	Barque "Julia H."	Jan. 2—Aug. 25, 1882.	Swansea to Baltimore and home.	1881, p. 55.
Capt. W. Deuchars -	S.S."Jan Mayen"	March 14—Aug. 4, 1882.	Dundee and Greenland -	—
Capt. W. Ellery -	"Majestic" -	Jan. 24—Sept. 4, 1882.	Liverpool, Calcutta, and home.	1881, p. 99.
Capt. T. W. Freeman.	S.S. "Bellerophon."	May 27—Oct. 3, 1882.	Liverpool, China, and home.	1882, p. 15.
Capt. D. Gray -	S.S. "Eclipse" -	March 15—July 4, 1882.	Greenland - -	1881, p. 55.
Capt. S. B. Gray -	Barque "Letterewe."	July 29, 1881—July 27, 1882.	London, Sydney, and home.	1881, p. 30.
Lieut. R. F. Hoskyn, R.N., commanding, assisted by Lieut. F. W. Shortland, R.N., and Lieut. H. Baker, R.N.	H.M.S. "Flying Fish."	June 1, 1881—Jan. 31, 1882.	Surveying in the neighbourhood of Japan.	—

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. W. P. Hughes	"Laomene" -	June 30, 1881—July 15, 1882.	Liverpool, Melbourne, San Francisco, and home.	1881, p. 3.
Capt. A. W. Jeffery	S.S. "Humboldt"	April 8—June 20, 1882.	Rio Janeiro, New York, and home.	—
Capt. J. Lawson -	S S. "Minho" -	April 24—June 30, 1882.	Southampton, Monte Video, and home.	1882, p. 9.
Capt. C. Lehman -	Barque "Mikado."	Aug. 18, 1880—July 26, 1881.	London, Japan, Cebu, and New York,	—
Capt. J. F. L. P. Maclear, R.N., Lieut. H. E. Roper, R.N.	H.M.S. "Alert"	Feb. 2—Sept. 6, 1882.	Surveying Southern Indian Ocean, and home.	1881, p. 138.
Capt. E. J. Molony	"British Merchant."	Nov. 26, 1881—July 6, 1882.	Liverpool, Calcutta, and home.	1881, p. 55.
Capt. F. Norman -	Barque "Polestar"	Nov. 7, 1881—Aug. 14, 1882.	Liverpool, Valparaiso, and home.	—
Capt. M. Parry -	Barque "Queen of Cambria"	Sept. 8, 1881—Sept. 6, 1882.	Cardiff, Monte Video, Bassein, and Amsterdam.	1881, p. 62.
Capt. H. Parsell -	S.S. "Baltic" -	April 22—Sept. 5, 1882.	Liverpool and New York (5 voyages).	1881, p. 55.
Capt. C. W. Pearson	S.S. "Strathleven."	March 8—Sept. 24, 1882.	Japan, New York, and home.	1881, p. 125.
Capt. T. Robinson -	"Chinsura" -	Jan. 8—Aug. 31, 1882.	Liverpool and Calcutta -	1881, p. 88.
Capt. Alexander Ross	Barque "Trochrague."	Sept. 30, 1881—Sept. 19, 1882.	London, Algoa Bay, Madras, Vizagapatam, and home.	—
Captain J. Russell -	"Baroda" -	Jan. 9—Sept. 17, 1882.	Liverpool and Calcutta -	1881, p. 92.
Capt. W. Scott -	Barque "Commewyne."	May 6—Aug. 19, 1882.	Ayr, Demerara, Barbados, and home.	1882, p. 18.
Capt. W. Spratly -	S.S. "Rubens" -	March 21—June 19, 1882.	Monte Video and home -	1881, p. 134.
Do. -	S.S. "Humboldt"	July 18—Sept. 22, 1882.	Do. - - -	Do.
Capt. J. H. Stiven -	"Arethusa" -	Aug. 24, 1881—June 26, 1882.	Glasgow, Calcutta, and home.	1880, p. 40.
Capt. R. Studdert (kept by officers).	S.S. "Cotopaxi"	March 14—June 23, 1882.	Australia and home -	—
Capt. W. Symington (since deceased).	S.S. "Hankow"	April 2—Aug. 19, 1882.	Cardiff, Hankow, and Suez.	1881, p. 134.
Capt. R. S. Tannock	"Glencairn" -	Nov. 26, 1881—July 23, 1882.	Cardiff, Rangoon, and home.	1878, p. 21.
Capt. W. Waring -	S.S. "Gordon Castle."	Feb. 12—Aug. 24, 1882.	London, China, New York, Antwerp.	1881, p. 125.
Capt. H. P. Wight -	"Oamaru" -	Oct. 30, 1881—Sept. 3, 1882.	Glasgow, Otago, Rangoon, and home.	1881, p. 42.
Capt. H. Youlden -	"May Hulse" -	Dec. 12, 1881—Aug. 23, 1882.	Cardiff, Valparaiso, Mexillones, and home.	1880, p. 82.
Capt. Sir A. Young, C.B., R.N.R. (kept by J. Price, Esq., surgeon, R.N.).	S.S. "Hope" -	June 29—Aug. 14, 1882.	Leigh Smith's Search Expedition.	1876, p. 140.

Mr. Scott was instructed to present the Charts (O. 27) to Captains Bell, Broadfoot, Jeffery, Lehman, Norman, Ross, Lieutenants Roper and Shortland, and Captain Studdert; O. 32 to Lieutenant Baker and Captain Deuchars; O. 43 to Lieutenant Hoskyn; and to convey the best thanks of the Council to the other observers.

The Secretary was instructed to write to the widow of the late Captain Symington, for more than 11 years an observer for this Office, conveying to her the Council's high appreciation of the value of Captain Symington's services to the Office, and the expression of their sympathy with her in her bereavement.

Submitted—The following report:—

SIR, September 30, 1882.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 30th September 1882.

I was absent from the Office for six weeks' vacation.

The remarks to accompany the sea surface temperature charts have been completed; the charts have also been revised, and many additions have been made to them. The sea surface temperature charts, which were placed in Mr. Malby's hands for printing on 22nd June last, are making satisfactory progress. I have been in frequent communication with Mr. Malby respecting them.

I have, &c.

Capt. H. Toynbee, F.R.A.S.,
Marine Superintendent.

(Signed) C. W. BAILLIE,
Nav. Lieutenant, R.N.

Submitted—Five charts of the North Atlantic plotted respectively for local noon and for Greenwich noon (as directed, Minutes, June 8). It was resolved that Capt. Toynbee be instructed to plot the observations for Greenwich noon.

The Chairman reported, with reference to the resolution of June 22 as to the employment of special officers to visit ships in London or Liverpool, that Mr. Allingham (Letter 2400) had been and was still employed in London, his services having been found very useful; and that Mr. W. J. Spicer had been employed for a short time in Liverpool. The Chairman was authorised to sanction the continued employment of a special visiting officer in London, and, if it should be found desirable, in Liverpool also.

Read—Letter 1454 from the Treasury (dated June 28), stating that no superannuation allowance could be made by the Government to Mr. J. S. Harding, the office keeper (Minutes, p. 16.)

Resolved—That a superannuation allowance of 42*l.* 16*s.* 5*d.* per annum, chargeable upon the annual grant to the Office, be made to Mr. Harding, to date from October 15th, being the amount to which he would be entitled on the Government scale, for 22 years' service from the time at which he entered the Board of Trade.

The Chairman stated that he had allowed Mr. Harding's retirement to date from the expiration of his vacation, and had appointed Mr. R. G. Canham to take his place *ad interim* as office keeper. The action of the Chairman was approved, and the appointment of Mr. Canham as office keeper at the salary of 100*l.* per annum, to date from September 18th, was confirmed.

Reported—That Mr. A. W. Green and Mr. G. N. Huntly had both passed the Civil Service examination. The former had returned to the Office, September 13th, as a copyist, at 2*l.* per week; the latter had resigned, and Mr. E. Hood had been appointed temporary clerk in his place at 12*s.* per week (for 8 hours) from October 9th.—Approved.

RETURN of the RESULT of the COMPARISON between the WARNINGS ISSUED and the WEATHER EXPERIENCED in 1881.

Coasts.	Total No. of Orders to Hoist and Repetitions.	Warnings justified by subsequent Gales, Force 8 and upwards.	Warnings justified by subsequent strong Winds, Forces 6 and 7.	Warnings not justified by subsequent Weather.	Warnings late, Force 9, reached at two Stations before issue.	Warnings partially late, Force 9 reached at one Station before issue.	Warnings in Error, owing to Telegraphic Mistakes.	Storms for which no Warning was issued.
Ireland, south -	63	39	15	7	—	2	—	Feb. 7.
„ east - -	55	30	14	10	—	1	—	Feb. 7, Apr. 3.
Scotland, east -	51	37	6	6	1	1	—	May 15, July 7, Dec. 18, Dec. 26.
„ west -	44	27	9	6	—	2	—	May 15.
England, north-west -	50	31	9	7	—	3	—	Feb. 7, Apr. 3.
„ west -	50	21	17	12	—	—	—	Feb. 7, Apr. 3.
„ south -	63	33	19	7	3	1	—	Feb. 7, Apr. 3, Apr. 7, Nov. 21,* Nov. 24.*
„ south-east -	31	20	4	7	—	—	—	Feb. 7, Apr. 3, Apr. 7, Nov. 21.
„ east -	47	28	13	5	—	1	—	Feb. 7, Dec. 18.
Totals - -	454	266	106	67	4	11	—	
Percentages -	—	58·6	23·3	14·8	0·9	2·4	—	

* Storms on the South coast marked thus were only felt in the Eastern part of the Channel.

SUBMITTED—The following STATEMENT respecting the RECORDS for October 1881, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868 and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH :—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Indifferent.	Direction. Good.	Velocity. Indifferent.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action														
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	0	0	0	0	*5 hrs. †3 hrs.	*5 hrs.	0	0	§3 hrs.	§4 hrs.	0	0	*4 hrs.	*10 hrs.
Orientation verified	31st	—	31st	—	29th	—	—	—	5th	—	25th	—	7th	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ irregular differences	0	1	0	0	1	3	44	26	4	0	0	1	0	0
Result of 40 *Remeasurements* :—														
Greatest difference	0·0	2·0	0·0	1·0	1·0	1·0	3·0	2·0	0·0	1·0	0·0	2·0	0·0	3·0
Mean difference irrespective of sign	0·0	0·4	0·0	0·5	0·0	0·3	0·3	0·6	0·0	0·5	0·0	0·6	0·0	0·8
Residual difference (—Meteorological Office)	0·0	+0·1	0·0	+0·2	0·0	+0·2	—0·1	0·0	0·0	0·0	0·0	+0·1	0·0	+0·1
RAIN GAUGE :—														
Action	Good.		Good.		Indifferent.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		7 hrs.		0		0	
„ „ other causes	0		0		0		0		‡8 hrs.		0		*2 hrs.	
Errors in tabulation	0		1		4		2		3		2		0	

BAROGRAPH :—							
Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Do.	Indifferent.	Do.	Do.	Do.	Bad.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
„ „ failure of light	0	0	0	0	0	0	0
„ „ other causes	*†3 hrs.	0	‖2 hrs. ¶1 hr.	0	0	‖1 hr.	‖42 hrs.
No. of errors discovered—							
In entry of standard	0	1	0	17	8	6	0
„ calculating residual correction	0	0	0	10	4	0	0
„ applying residual correction	0	0	0	11	4	1	2
„ subtraction in subsidiary tables	0	0	1	8	1	1	1
„ tabulation by subsidiaries	0	0	0	0	0	0	0
„ „ irregular differences	1	0	0	17	2	0	2
***Result of* 40 *Remeasurements* :—**							
Greatest difference	0·006	0·008	0·007	0·007	0·005	0·005	0·010
Mean difference irrespective of sign	0·002	0·002	0·003	0·003	0·002	0·002	0·003
Residual difference (— Meteorological Office)	—0·001	—0·001	0·000	—0·001	0·000	0·000	—0·001
Mean monthly difference between simultaneous barograph and barometer readings	0·002	0·003	0·001	0·002	0·002	0·001	0·002

THERMOGRAPH :—																
Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.			
Photography	Do.		Do.		Indifferent.		Do.		Do.		Do.		Indifferent.			
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.		
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	10 hrs.	10 hrs.	0	0		
„ „ failure of light	0	0	0	0	0	0	0	0	0	1 hr.	0	0	1 hr.	0		
„ „ imperfectly moistened bulbs	—	0	—	0	—	4 hrs.	—	1 hr.	—	0	—	11 hrs.	—	3 hrs.		
„ „ partially frozen bulbs	—	0	—	3 hrs.	—	0	—	2 hrs.	—	4 hrs.	—	1 hr.	—	0		
„ „ other causes	0	0	**11 hrs.	11 hrs.	‖1 hr.	0	0	0	0	0	‖38 hrs.	‖38 hrs.	‖1 hr.	0		
No. of errors discovered in entry of standard	0	0	0	1	4	4	12	0	0	0	0	0	1	1		
„ „ by subsidiary measurements	0	0	0	0	0	0	3	1	0	0	0	0	0	0		
„ „ of subtraction in do. tables	0	0	0	1	1	0	4	24	2	4	0	0	2	1		
„ „ detected under glass scale	1	0	2	0	1	43	††3	6	2	29	2	3	4	1		
***Result of* 40 *Remeasurements* :—**																
Greatest difference	0·3	0·2	0·3	0·2	0·3	0·5	0·2	0·3	0·3	0·4	0·3	0·5	0·2	0·3		
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·0	0·1	0·1	0·1		
Residual difference (— Meteorological Office)	—0·1	0·0	0·0	0·0	0·0	—0·1	0·0	0·0	0·0	—0·1	0·0	+0·1	—0·1	—0·1		
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·2	0·2	0·2	0·1	0·1	0·2	0·1	0·2	0·2	0·1	0·1	0·2	0·2		
No. of errors in maxima and minima	3	—	2	—	0	—	10	—	3	—	4	—	4	—		

* Cleaning instrument. † Repairing instrument. ‡ Tube choked by dirt. § Failed to lower pencils. ‖ Photographic imperfections. ¶ Examining instrument.
** Shutter stopped clock. †† Tabulations 50 and 51 were returned to Observatory for re-tabulation owing to the large number of errors.

Submitted—The following reports:—

REPORT of INSPECTION of the IRISH and WELSH STATIONS with SCILLY.

GENTLEMEN,

I HAVE to report that I have completed the inspection of all the stations in Ireland and Wales except Street, Co. Longford, where the observer has found it impracticable to maintain his records.

OBSERVATORIES.

Valencia, October 4.—Observatory in good order. The repairs to the sea wall, authorised last year, have been executed in a satisfactory manner, and Mr. Cullum keeps the premises in a neat and tidy condition. He applies for a grant of 3*l*. 10*s*. for a new mule cart, his own having been worn out in the service of the observatory. The allowance for horse keep made to Mr. Kerr formerly has not been continued to Mr. Cullum.

Armagh, October 10.—Instruments in good order. Dr. Dreyer has forwarded applications from himself and Mr. Call, requesting a reconsideration of the terms of the allowance to the observatory.

TELEGRAPHIC REPORTING STATIONS.

Scilly, September 14.—The instruments were in a satisfactory condition. The pillar on which the small anemograph is placed rocks in gales, so that the pendulum strikes the wall of the anemograph case and stops the clock. I am in correspondence with Mr. Munro about this defect.

St. Ann's Head, September 28.—The station calls for no remark. The observations are well taken, and the exposure very good. The instruments are in good order.

Valencia, October 4.—Instruments in good order. I regret to say that telegraphic communication with the station is in an unsatisfactory condition.

Roche's Point, October 6.—Station satisfactory; nothing to remark.

Parsonstown, October 7.—This station was satisfactory also.

Donaghadee, October 11.—The station is in very good order, and Mr. MacGowan, the observer, is most zealous.

Mullaghmore, October 13.—The station is in good order. I find that the difficulties about laying the private wire from Cliffony are now removed, and I propose to carry this out as soon as I can. Mr. Kerr asks for an increase in his allowance, in view of the increase in his work.

Holyhead, October 19.—This station calls for no special remark. The Stevenson's screen has been erected, and the thermometer readings are improved thereby.

STATIONS for the WEEKLY WEATHER REPORT.

Waterford, September 29.—This station is not very satisfactory, but, under the circumstances, I see no prospect of improvement, or of the substitution of another station for the present one.

Foynes, October 2.—Station in good order, and observer anxious to improve. I regret, however, that there is no present prospect of barometer readings being obtainable.

STATIONS of the SECOND ORDER.

Helston, September 18.—This station promises fairly well. The observer, Mr. Gill, is the schoolmaster. He has no barometer, but he attends to his thermometers and rain-gauge carefully.

St. David's, September 27.—As usual, in excellent order. The observer has begun to observe cirrus clouds. He has not been able to make much use of the reflecting nephoscope.

Birr Castle.—See remarks above.

Londonderry, October 12.—Nothing to remark; observer very careful.

Colebrooke, October 14.—Station not very satisfactory. The observer, Mr. Ferguson, the gardener, has not had training enough in taking such observations. The instruments are in good order.

Markree Castle, October 13.—Station in good order.

Dublin, Mountjoy Observatory, October 9.—Station calls for no remarks. The exposure is very good.

Dublin, FitzWilliam Square, October 18.—This continues to be as good a station as it is possible to have in the confined locality afforded by a town garden.

Dublin, Glasnevin, October 18.—The station has gradually become thoroughly satisfactory in every respect. A vane has been erected on the large conservatory, which supplies a great defect previously existing.

I append the following table of errors of thermometers :—

—	Dry Bulb.	Wet Bulb.	Max.	Min.	Spare.	2nd Spare.	Grass Min.	Remarks.
Scilly - - -	+·2	+·7	+·1	−·6	—	—	—	? These were determined by comparison with the spare thermometer at the station, as standard had been broken.
St. Ann's Head - -	+·4	+·2	−·4	+·1	—	—	—	
Valencia - - -	+·6	+·7	+·9	−·5	+·9	—	—	
Roche's Poin - -	+1·1	+1·0	+1·9	−·1	—	—	—	
Parsonstown - -	+·9	+·5	+·3	+·2	+·5	+·2	—	The spare thermometers are respectively the 2nd maximum and minimum instruments.
Donaghadee - -	+·4	+·6	+·3	+·2	+·6	—	—	
Mullaghmore - -	+·2	+·1	+·5	+·3	+·3	+·2	—	
Holyhead - - -	+·3	+·1	0	−·7	+·9	—	—	
Foynes - - -	+·6	+·7	+·7	−·1	—	—	—	
Londonderry - -	0	0	+·9	−·9	+·2	—	—	Spirit separated in minimum. Perhaps it had not fully joined when reading taken.
Helston - - -	0	+·1	−·6	−1·2	—	—	—	Dry bulb taken as standard. See above under Scilly.
St. David's - -	+·1	+·2	−·1	+·1	—	—	−·1	
Colebrooke - -	+·6	+·4	+·4	+·2	—	—	—	
Markree - - -	+·4	+·3	+·5	+·3	—	—	+·1	
Mountjoy Observatory	+·6	+·5	+·9	+·2	—	—	+·2	
FitzWilliam Square -	+·3	+·3	+1·0	+·1	+·4	—	—	
Glasnevin - - -	+·5	+·8	+1·2	−·7	—	—	−·2	

I did not test the solar radiation thermometers.

ROBERT H. SCOTT.

REPORT on INSPECTIONS of SELF-RECORDING OBSERVATORIES of the METEOROLOGICAL COUNCIL, 1882, by G. M. WHIPPLE.

Falmouth, visited September 7–9.—The instruments were in good order. I had clocks of barograph and thermograph cleaned, as well as lenses, and compared standard thermometers with the following results :

Kew Standard.	Falmouth Dry Bulb, No. 383.
Mean of 3 readings 59°·1 - -	- 59°·5
	Correction to 383 = −0°·4
	Falmouth Wet Bulb, No. 388.
„ „ 55°·8 - -	- 56°·0
	Correction to 388 = −0°·2

The corrections in use were No. 383 − 0°·3 ; No. 388 = −0°·2.

I re-blackened the stem of the wet-bulb thermometer, as a considerable quantity of stray light was falling on the cylinder.

The anemometer has been re-fitted throughout since last inspection, and facilities for oiling and adjustment have been provided on the new stand.

I found that owing to the warping of the wood the shafts were out of the vertical, and therefore shifted the stand supporting the recording apparatus about 2 inches northward.

A new time pricker was fitted to replace the old one, which was much bent.

The cups were in good order, but one fan of the direction apparatus was very loose on its spindle ; this I packed with sheet lead and screwed tight.

The sunshine recorder was properly fixed, the rain gauge was also in good order, the clock having been recently cleaned.

The spare "Glaisher" gauge was not well placed. I gave instructions for fixing it in a more satisfactory manner.

Armagh Observatory, visited September 15–16.—Barograph and thermograph were both in good order, clocks having been recently cleaned. I fitted new weights and counterpoises to the light-shutter gearing, so as to avoid the failures that were recently so numerous. Wiped lenses, mirrors, &c., and fitted new screws to the scales of the standard thermometers, the others being corroded away.

Compared the thermometers with following results :—

Kew Standard.	Dry Bulb.	
58°·3 - -	58°·8 - -	Correction −0°·5
	Wet Bulb.	
57°·7 - -	58°·2 - -	Correction −0°·5

The anemograph was thoroughly examined and found in good order throughout, the cut bearing not having deteriorated since it was rectified in 1879.

The rain gauge was in good order, save that the mercury was dirty; this was remedied by filtration.

The sunshine recorder was found to be correctly placed.

Dr. Dreyer, the recently appointed director of the observatory, availed himself of the opportunity afforded by my visit to become acquainted with the details of the instruments.

Valencia Observatory, visited September 20–22.—The anemograph at this observatory may be considered as almost worn out.

Constructed by Messrs. Beck, it was originally less substantially made than the instruments at the other observatories, and it has experienced severe usage.

The cups and fans are greatly corroded, but as it would be difficult to re-fit new ones I would recommend, if possible, the complete substitution of another instrument, if one is available.

The one in store at Kew could be put in order at a small expense, if the De La Rue recording apparatus were set aside.

I had all parts of the instrument cleaned and re-adjusted.

The barograph and thermograph clocks and lenses were cleaned, new lines fitted, and counterpoise weights screwed on to light-shutter levers.

The minimum thermometer had some spirit in its chamber; this was put right.

I was unable to test the standard thermometers at this or any observatories subsequently visited, my standard thermometer having been unfortunately broken in transmission to Dublin from Armagh, where I had accidentally left it behind.

The rain gauge and sunshine recorder appeared in good order.

Aberdeen Observatory, visited September 27–29.—Here I found the photographic instruments in good order, but had clocks cleaned and counterpoises fitted; the cases slightly interfered with shutter action; this was set right.

The lubrication of the external parts of the anemograph was not satisfactory, the oil being almost solidified, and the friction rollers firmly imbedded in it, so that all had to be taken to pieces and the oil removed. This was done and the instrument re-mounted in a proper condition.

The recording apparatus was dismounted and the cylinder carefully examined for the irregularities reported by Mr. Buchan; it was found, however, to be perfectly true in every part, and not fixed excentrically on its axis.

The pencils and their fittings were examined, cleaned, and the instrument replaced and freshly oriented.

The other instruments were in excellent condition.

Glasgow, visited October 2–4.—Finding all instruments in good order, only the usual clock and lens cleaning was done. When the anemograph was dismounted I rectified according to the blank forms at that date in use in the observatory, the direction pencil, which slightly overlapped the ruling on one side.

The rain gauge requiring painting I called Professor Grant's attention to it, and he promised to get it done at once.

Stonyhurst, visited October 6.—In the absence of the Rev. S. J. Perry, at Madagascar, I was received by the Rev. J. New, who has taken charge temporarily. All the instruments were in good order, but received the usual cleaning during my visit.

The anemograph not being provided with a pricker for time setting, difficulty is being constantly found in the correct timing of the curves.

I pointed out a way in which this might be rectified by an engineer at present engaged on the college works.

The observers called my attention to the inconvenience they experienced in copying their anemograms on account of a discrepancy between their metallic and tracing sheets, and also to the fact that they, in the absence of their director and first assistant, are uncertain as to the correctness of their present work, the remark sheets from the Meteorological Office being many months in arrear.

Radcliffe Observatory, visited October 19.—The photography at this observatory is unusually good, the curves far surpassing those at any other of the observatories in the kingdom. I was unable to find any special cause, the paper and the formulæ being the same as those used at other observatories.

The barograph and thermograph were both in good order. The wet-bulb thermometer is not altogether satisfactorily set up, and its definition might be better. Attempts to improve it, however, failed, as if pushed further a risk of breakage of the instrument would have been run.

The anemograph has been recently repaired and was in good order. The maker has not quite completed its renewal; new stays and some screws have yet to be fitted.

The rain gauge was in good order as was also the sunshine recorder, this instrument, however, standing loosely on a stone table, appeared to be subject to a risk of being thrown out of adjustment in the operation of changing the cards.

I called Mr. Stone's attention to the fact and he promised to have the slate cemented down to the stone.

Office

Report on the Forecasts for the Month of May 1882.

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Entire Forecast.	Percentage of Success a + b.
Scotland, N.	a	33	45	39	73
,,	b	30	37	34	
,,	c	30	7	18	
,,	d	7	11	9	
Scotland, E.	a	48	56	52	85
,,	b	33	33	33	
,,	c	15	11	13	
,,	d	4	—	2	
England, N.E.	a	37	48	43	78
,,	b	33	37	35	
,,	c	22	8	15	
,,	d	8	7	7	
England, E.	a	56	59	58	86
,,	b	37	19	28	
,,	c	4	15	9	
,,	d	3	7	5	
Midland Cos.	a	59	67	63	84
,,	b	30	11	21	
,,	c	7	15	11	
,,	d	4	7	5	
England, S.	a	52	52	52	87
,,	b	44	26	35	
,,	c	4	18	11	
,,	d	—	4	2	
Scotland, W.	a	45	44	45	84
,,	b	33	44	39	
,,	c	7	4	5	
,,	d	15	8	11	
England, N.W.	a	48	41	45	76
,,	b	30	33	31	
,,	c	11	15	13	
,,	d	11	11	11	
England, S.W.	a	30	56	43	78
,,	b	33	37	35	
,,	c	30	7	19	
,,	d	7	—	3	
Ireland, N.	a	26	48	37	76
,,	b	44	33	39	
,,	c	15	8	11	
,,	d	15	11	13	
Ireland, S.	a	30	41	36	76
,,	b	40	40	40	
,,	c	19	4	11	
,,	d	11	15	13	

8 P.M.

Districts.		Percentages. Wind.	Weather.	Entire Forecast.	Percentage of Success a + b.
Scotland, N.	a	42	61	52	77
,,	b	26	23	25	
,,	c	26	13	19	
,,	d	6	3	4	
Scotland, E.	a	48	58	53	89
,,	b	36	36	36	
,,	c	13	6	10	
,,	d	3	—	1	
England, N.E.	a	39	55	47	81
,,	b	39	29	34	
,,	c	19	13	16	
,,	d	3	3	3	
England, E.	a	55	36	46	86
,,	b	32	48	40	
,,	c	13	10	11	
,,	d	—	6	3	
Midland Cos.	a	55	49	52	86
,,	b	39	29	34	
,,	c	6	19	13	
,,	d	—	3	1	
England, S.	a	48	32	40	76
,,	b	29	42	36	
,,	c	23	23	23	
,,	d	—	3	1	
Scotland, W.	a	55	65	60	78
,,	b	10	26	18	
,,	c	22	9	16	
,,	d	13	—	6	
England, N.W.	a	39	45	42	86
,,	b	45	42	44	
,,	c	10	10	10	
,,	d	6	3	4	
England, S.W.	a	48	61	55	90
,,	b	39	32	35	
,,	c	10	—	5	
,,	d	3	7	5	
Ireland, N.	a	29	52	41	88
,,	b	52	42	47	
,,	c	10	—	5	
,,	d	9	6	7	
Ireland, S.	a	29	68	49	81
,,	b	45	19	32	
,,	c	13	10	11	
,,	d	13	3	8	

Summary.

British Isles	a	42	51	47	81
,,	b	35	32	34	
,,	c	15	10	12	
,,	d	8	7	7	
British Isles	a	44	53	49	84
,,	b	36	34	35	
,,	c	15	10	12	
,,	d	5	3	4	

Submitted—The following statement of accounts for the three months ending 30th June 1882:—

Income.	£ s. d.	£ s. d.
Balance from year 1881–82		1,102 11 8
Proportion of vote for quarter		3,825 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	4 7 11	
(2.) Special researches	10 8 2	
(3.) Observatories and stations	0 16 8	
		15 12 9
Supply of Weather Information:		
D.W. charts and forecasts	59 12 4	
6 p.m. charts	7 11 0	
Information for Press Agencies, &c.	23 16 0	
Telegrams	60 3 6	
		151 2 10
Supply of Miscellaneous data		4 19 0
Sale of Instruments, &c.:		
Mercantile Marine account	37 11 0	
Royal Navy	0 15 0	
		38 6 0
Commission charged on work done for Colonies, &c.		12 17 5
		£5,150 9 8

Expenditure.	£ s. d.	£ s. d.
Administration:		
Payment of Council	250 0 0	
Secretary	200 0 0	
Salaries and wages	180 6 1	
Rent, fuel, and lighting	167 9 6	
Furniture and fittings	30 10 0	
Incidental and contingent expenses	82 15 6	
		911 1 1
Special Researches		56 13 6
Land Meteorology:		
Observatories and stations	582 2 1	
Discussion and reduction of observations	367 2 4	
		949 4 5
Weather Information and Forecasts:		
Telegraphic reports and storm warnings	681 2 3	
Preparation and issue of reports and forecasts	371 17 10	
		1,053 0 1
Inspections:		
Salaries and travelling expenses		103 3 0
Ocean Meteorology:		
Discussion and reduction of observations	394 17 7	
Expenses incidental to the supply of instruments:		
Proportion for care and issue of instruments	50 0 0	
Royal Navy	18 2 4	
Mercantile Marine	132 12 4	
Distant island and coast stations	18 12 6	
		614 4 9
Balance		1,463 2 10
		£5,150 9 8

Liabilities.	£ s. d.
To Council	250 0 0
„ Post Office (partly estimated)	347 11 10
„ sundry creditors	490 7 7
„ „ contracts (or work uncompleted)	198 17 0
„ balance	1,463 2 10
	£2,749 19 3

Assets.	£ s. d.
By cash at Bank	1,789 3 9
„ „ at Office	151 11 3
„ „ at Valencia	50 0 0
„ sundry debtors	434 4 3
„ H.M. Exchequer	325 0 0
	£2,749 19 3

The following cheques for July were drawn on the 31st of that month:—

Administration:	£ s. d.	£ s. d.
R. H. Scott, salary		66 13 4
J. S. Harding, jun. } T. D. Bell } J. S. Harding, sen. } Salaries and wages	27 15 6 14 8 10 *11 4 7	
		53 8 11
Carried forward		£120 2 3

* Five weeks ending 29th July 1882.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	120	2	3
Administration—*cont.*						
Pickford & Co., carriage of parcels - -	-		-	4	12	9
Wightman & Co., printing - - -	-		-	1	3	6
Williams and Norgate, books - - -	-		-	2	16	3
Special Researches:						
L. P. Casella, instruments - - -	-		-	16	10	0
C. E. Strachan, Arctic work - - -	-		-	3	3	9
C. Harding, Kerguelen Island - - -	-		-	5	0	0
Land Meteorology:						
R. H. Curtis -	22	4	5			
J. A. Curtis -	15	11	1			
T. E. Allen - (Discussion, &c. of Observations.)	15	11	1			
C. H. Thompson -	*12	2	6			
E. G. Aldridge -	* 9	15	10			
				75	4	11
G. Buck, type stamps - - - -	-		-	2	2	6
R. & J. Beck, zinc plates - - -	-		-	25	3	0
E. Burton, computations - - -	2	0	0			
E. E. Cobley, „ - - -	3	0	0			
				5	0	0
Weather Information and Forecasts:						
F. Gaster -	31	14	4			
W. L. Dallas -	5	11	10			
F. Brodie - (Preparation &c. of D.W. Reports.)	19	15	10			
G. G. Francis -	22	6	10			
A. J. Rigby -	15	0	0			
R. Sargeant -	*13	10	9			
				107	19	7
F. Dangerfield, delivery of D.W. Charts -	-		-	11	13	3
Postmaster General, telegrams - - -	-		-	136	0	1
Ocean Meteorology:						
H. Toynbee - -	33	6	8			
C. W. Baillie - -	20	16	8			
R. Strachan - - (Discussion &c. of observations, and care of instruments.)	27	15	6			
C. Harding - -	22	4	5			
H. Harries - -	14	12	6			
				118	15	9
J. Gill - -	10	8	10			
P. Feathers - (Agents at ports - -)	4	15	0			
Z. Scaping -	9	13	9			
				24	17	7
L. A. Strachan, synchronous observations -	-		-	6	12	0
Pewtress & Co., advertisements - -	-		-	1	17	6
C. H. Gray, "A" freight - - -	-		-	4	2	0
Miscellaneous:						
T. De La Rue & Co., commissions - -	-		-	24	14	2
Chance Bros. & Co., „ - -	-		-	33	15	0
J. J. Hicks, „ - -	-		-	11	5	0
L. P. Casella, „ - -	-		-	4	11	10
J. S. Harding, jun., petty cash - -	-		-	60	0	0
R. H. Scott, „ - -	-		-	25	0	0
				£832	2	8

* Five weeks ending 29th July 1882.

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.
July 8th	28	8	9
„ 15th	28	8	9
„ 22nd	28	8	9
„ 29th	29	3	9
	£114	10	0

The following cheques for August were drawn on the 31st of that month:—

		£	s.	d.	£	s.	d.
Administration:							
R. H. Scott, salary					66	13	4
J. S. Harding, jun.	Salaries and wages	27	15	6			
T. D. Bell		14	8	10			
J. S. Harding, sen.		*8	19	8			
					51	4	0
Pickford & Co., carriage of parcels					3	11	2
Special Researches and Experiments:							
E. I. Strachan, Arctic observations					3	9	0
Land Meteorology:							
J. E. Cullum, salary†					33	6	8
Johnson and Matthey, nitrate of silver					2	13	0
R. H. Curtis	Discussion, &c. of Observations.	22	4	5			
J. A. Curtis		15	11	1			
T. E. Allen		15	11	1			
C. H. Thompson		*9	12	9			
E. G. Aldridge		*7	15	5			
					70	14	9
Weather Information and Forecasts:							
Postmaster General, telegrams					182	12	5
F. Gaster	Preparation, &c. of Weather Reports.	28	9	4			
F. Brodie		21	4	2			
G. G. Francis		17	19	0			
A. J. Rigby		15	0	0			
R. Sargeant		*13	5	0			
					95	17	6
Ocean Meteorology:							
Captain H. Toynbee	Discussion &c. of observations, and care of instruments.	33	6	8			
Nav. Lieut. C. W. Baillie, R.N.		20	16	8			
R. Strachan		27	15	6			
C. Harding		*22	4	5			
H. Harries		11	12	9			
					115	16	0
J. J. Hicks, thermometer screens					12	14	2
W. Allingham, visiting ships					6	15	0
C. H. Permain, Southampton agent					3	17	6
J. H. Woodstock, packing cases					3	4	6
J. Green, care of Bermuda anemometer					4	11	0
Miscellaneous:							
J. S. Harding, jun., petty cash					50	0	0
					£707	0	0

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.
5th August	28	8	9
12th „	26	6	9
19th „	25	6	9
26th „	31	13	6
	£111	15	9

* Four weeks to the 26th August.

† For two months.

Submitted—The following statement of accounts for the six months ending 30th September 1882 :—

Income.	£ s. d.	£ s. d.
Balance from year 1881–2		1,102 11 8
Proportion of vote for 6 months		7,650 0 0
Repayment of expenses charged under—		
(1.) Incidental expenses	8 10 2	
(2.) Special researches	10 8 2	
(3.) Observatories and stations	4 14 8	
		23 13 0
Supply of Weather Information :		
D.W. charts and forecasts	135 8 2	
6 p.m. charts	13 16 0	
Information for Press Agencies, &c.	48 10 0	
Telegrams	81 6 9	
		279 0 11
Supply of Miscellaneous data		7 6 0
Sale of Instruments, &c. :		
Mercantile Marine account	51 6 10	
Royal Navy	21 0 0	
		72 6 10
Commission charged on work done for Colonies, &c.		14 4 2
		£9,149 2 7

Expenditure.	£ s. d.	£ s. d.
Administration :		
Payment of Council	500 0 0	
Secretary	400 0 0	
Salaries and wages	376 10 11	
Rent, fuel, and lighting	320 19 11	
Furniture and fittings	30 10 0	
Incidental and contingent expenses	195 1 4	
Expenses contingent on Meteorological Congress	23 12 7	
		1,846 14 9
Special Researches		167 5 2
Land Meteorology :		
Observatories and stations	1,211 7 1	
Discussion and reduction of observations	733 9 3	
		1,944 16 4
Weather Information and Forecasts :		
Telegraphic reports and storm warnings	1,402 18 2	
Preparation and issue of reports and forecasts	743 14 10	
		2,146 13 0
Inspections :		
Salaries and travelling expenses		285 9 8
Ocean Meteorology :		
Discussion and reduction of observations	810 8 7	
Expenses incidental to the supply of instruments :		
Proportion for care and issue of instruments	100 0 0	
Royal Navy	187 0 9	
Mercantile Marine	290 3 3	
Distant island and coast stations	24 9 6	
		1,412 2 1
Balance		1,346 1 7
		£9,149 2 7

Liabilities.	£ s. d.	Assets.	£ s. d.
To Council	500 0 0	By cash at Bank	1,972 11 8
„ sundry creditors	788 9 8	„ „ at Office	203 19 6
„ contracts (or work uncompleted)	594 17 1	„ „ at Valencia	50 0 0
„ balance	1,346 1 7	„ H.M. Exchequer	650 0 0
		„ sundry debtors	352 17 2
	£3,229 8 4		£3,229 8 4

The following cheques for September were drawn on the 30th of that month :—

Miscellaneous :	£ s. d.	£ s. d.
R. H. Scott, travelling, on account (dated 22nd)	50 0 0	
J. S. Harding, jun., petty cash	50 0 0	
		100 0 0
Carried forward		£100 0 0

	£ s. d.	£ s. d.
Brought forward -	- -	100 0 0
Administration:		
R. H. Scott, salary - - - -	- -	66 13 4
J. S. Harding, jun. }	27 15 6	
T. D. Bell - - } Salaries and wages -	14 8 10	
J. S. Harding, sen. }	*11 4 7	
R. G. Canham - }	†3 17 0	
		57 5 11
C. W. Jacques, rent - - - -	- -	151 13 6
Bank of England, sale of S.O. forms - -	- -	16 12 0
E. Davis and Son, repairing locks, &c. - -	- -	1 14 10
F. Hatchett, copying composition - -	- -	1 13 0
W. Wightman & Co., printing - - -	- -	1 7 6
Pickford & Co., carriage of parcels - -	- -	2 16 2
Special Researches:		
W. Thomas, care of anemometer - -	- -	1 13 8
H. Williams do. - -	- -	2 12 3
C. E. Strachan, Arctic work - - -	- -	3 0 0
Land Meteorology:		
C. Niven, Aberdeen - - - -	- -	66 2 6
J. L. E. Dreyer, Armagh - - -	46 19 0	
Do. do. - - -	9 13 11	
		56 12 11
W. L. Fox, Falmouth - - - -	- -	72 10 0
R. Grant, Glasgow - - - -	- -	68 5 6
H. Williams, Holyhead - - -	- -	2 13 8
G. M. Whipple, Kew - - - -	- -	100 0 0
C. Clouston, Orkney - - - -	- -	5 13 6
G. H. Aird, Seaham - - - -	- -	2 13 10
J. New, Stonyhurst - - - -	- -	56 2 2
J. E. Cullum, Valencia - - -	42 10 8	
Do. (salary) - - - -	16 13 4	
		59 4 0
G. T. Watson, Yarmouth - - -	- -	3 19 0
R. & J. Beck, zinc plates - - -	- -	5 14 8
T. Culleton, stencil plates - - -	- -	2 1 4
Meteorological Society, observations - -	- -	25 0 0
E. E. Cobley, computations - - -	- -	4 7 0
R. H. Curtis - }	22 4 5	
J. A. Curtis - } Discussion, &c. of Observations.	15 11 1	
T. E. Allen - }	15 11 1	
C. H. Thompson - }	*12 2 6	
E. G. Aldridge - }	*9 15 10	
		75 4 11
Weather Information and Forecasts:		
J. W. Mayes, Ardrossan - - -	- -	1 0 0
Postmaster, Bundoran - - - -	- -	1 6 0
H. Todd, Cambridge - - - -	- -	4 11 0
Postmaster, Cliffony - - - -	- -	0 19 6
H. Mohn, Christiania - - - -	- -	5 10 0
T. MacGowan, Donaghadee - - -	- -	0 13 0
J. Costello, Dover - - - -	- -	3 18 6
W. Brand, Dunrossness - - -	- -	4 4 6
Postmaster, ,, - - -	- -	1 6 0
,, Fort William - - -	- -	0 16 0
W. Foster, Hawes Junction - - -	- -	3 18 3
Carried forward -	- -	£1,041 9 11

* Five weeks ending 30th September.
† Two weeks ending 30th September.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	1,041	9	11
Weather Information and Forecasts—*cont.*						
J. Tilston, Holyhead - - - - -			-	3	18	0
G. G. Appleton, Hurst Castle - - - -			-	3	18	6
Postmaster, Inverness - - - - -			-	1	6	0
J. Fisher, Jersey - - - - -			-	4	5	6
Postmaster, Killarney - - - - -			-	0	19	6
J. Hutchison, Leith - - - - -			-	0	13	0
Postmaster, Lerwick - - - - -			-	1	6	0
F. Gaster, London - - - - -			-	3	18	0
W. Berridge, Loughboro' - - - -			-	3	10	7
K. Kerr, Mullaghmore - - - -			-	9	16	5
M. Mackintosh, Nairn - - - - -			-	0	13	0
W. D. Penny „ - - - - -			-	4	4	6
W. Wickham, Oxford - - - - -			-	3	12	9
G. Phillips, Parsonstown - - - -			-	3	7	6
E. Kennedy, „ - - - - -			-	0	13	6
J. John, Prawle Point - - - - -			-	3	5	0
W. Kennedy, Roche's Point - - - -			-	0	13	6
G. Baker, St. Ann's Head - - - -			-	4	0	2
W. Thomas, Scilly - - - - -			-	4	18	4
R. W. Scaddan, Scilly - - - - -			-	0	13	0
J. B. Smith, Spurn - - - - -			-	3	5	6
D. Macdonald, Stornoway - - - -			-	5	11	4
Postmaster „ - - - - -			-	1	6	0
„ Valencia - - - - -			-	0	13	0
J. Murray, Wick - - - - -			-	1	6	0
J. Sinclair „ - - - - -			-	3	5	0
G. T. Watson, Yarmouth - - - -			-	4	2	6
A. Guy, York - - - - -			-	3	18	0
Postmaster-General, Valencia, private wire -	23	10	0			
„ telegrams - -	177	15	7			
				201	5	7
W. Wightman & Co., B.P. wrappers - -			-	7	0	0
F. Gaster -	34	10	8			
F. J. Brodie -	17	2	0			
G. G. Francis — Preparation, &c. of Weather Reports.	19	13	0			
A. J. Rigby -	15	0	0			
R. Sargeant -	*15	14	9			
				102	0	5
Inspections:						
A. Buchan, salary - - - -	37	10	0			
W. C. Ley, „ - - - -	37	10	0			
„ travelling expenses - -	19	9	6			
				94	9	6
Ocean Meteorology:						
Capt. H. Toynbee -	33	6	8			
Nav. Lieut. C.W.Baillie, R.N. — Discussion, &c. of observations and care of instruments.	20	16	8			
R. Strachan - -	27	15	6			
C. Harding - -	22	4	5			
H. Harries - -	*14	12	6			
				118	15	9
J. R. Jones, Aberdeen agent - - -			-	3	2	8
P. A. Feathers, Dundee agent - - -			-	2	5	0
J. Gill, Liverpool agent - - -			-	23	8	1
W. J. Spicer, collection of synchronous observations			-	12	15	9
W. Allingham, „ „ „			-	11	19	8
Total -				£1,701	12	5

* Five weeks ending 30th September.

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.
2nd September - - - - -	25	4	6
9th „ - - - - -	33	0	3
16th „ - - - - -	28	6	11
23rd „ - - - - -	27	2	1
30th „ - - - - -	27	14	1
Total - -	£141	7	10

Submitted—The following publications which had been issued since the last meeting:—

Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope, by Captain Toynbee.
Report on the Storm of October 13–14, 1881, by Mr. Scott.
Meteorological Observations at Stations of the Second Order for 1879.
Contributions to our Knowledge of the Meteorology of the Arctic Regions, Part III.
Quarterly Weather Report, 1879. Appendices and Plates.

116, *Victoria Street, November* 8, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (October 25) were read and confirmed.

Read—Letter 2253, from Captain Toynbee to the Chairman, pointing out that the observations for the Atlantic synchronous weather charts arriving at the Office exceeded the estimated number (Minutes, 1881, p. 124), and that extra assistance was required to enable the Marine Room to keep pace with the work.

The Secretary was authorised to engage temporarily two assistants to be employed in plotting the materials on the charts in the Marine Room.

Captain Toynbee was requested to insert on the charts the names of such land stations as may probably be hereafter required for connecting properly the sea and land observations.

Submitted—The draft remarks, prepared by Lieutenant Baillie, to accompany the charts of sea temperature (Minutes, October 25). Referred to the Hydrographer.

Resolved—That the discussion of the barometric observations for all the oceans of the globe (Minutes, 1881, p. 98) be intrusted to Mr. Baillie, and that he be allowed the assistance of a writer.

General Strachey made a preliminary report to the Council on the subject of cumulative temperatures (Minutes, p. 31). He was requested to communicate with Sir J. B. Lawes and Dr. Gilbert.

Submitted—Reports by Messrs. E. D. Archibald (Letter 383) and W. Ellis (Letter 2381) on the discussion of the Kerguelen observations (Minutes, 1880, p. 17). Referred to General Strachey.

Read—Letter 1563 from Mr. Call at Armagh Observatory, reporting that he had maintained hourly eye observations during an interruption to the photography, which was occasioned by alterations to the gas main, and lasted for a week.

Office

Resolved—That an allowance of 5*s*. per night be made to the observatory, being the same amount as had been allowed to Glasgow (Minutes, 1880, p. 117).

Reported—That the receipt of the telegraphic reports from Ben Nevis had ceased, the observations having been discontinued for the winter on the 2nd instant (Letter 2436).

Read—A memorandum from Captain Toynbee reporting that since the last meeting eight logs had been received, two of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. W. Barron -	S.S. "Empress"	June 28—Oct. 29, 1882.	Hull and Hamburg, nine voyages.	1882, p. 41.
Lieut. A. Carpenter, R.N., Lieut. A. Balfour.	H.M.S. "Magpie"	May 1—Sept. 1, 1882.	Surveying Sea of Japan	1882, p. 41.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Read—Letter 1582 from Dr. Meldrum (Minutes, 1881, p. 41) stating that it would be inconvenient to change the scale of the charts for the Indian Ocean for the months of January and March, as these two charts were already in an advanced stage; but that the Meteorological Society of the Mauritius would be glad to learn the precise scale which the Council would suggest for the remaining charts.

Mr. Scott was instructed to reply (Letter 2305) that the Council approve of the completion of the charts for the two months named, on the scale previously employed, and that they will forward at an early date a map of the Indian Ocean drawn on such a scale as they would recommend.

Submitted—The following statements of work for the four months ending October 31:—

November 7th, 1882.

MARINE ROOM.

Examined 53 new logs and 8 lighthouse registers.

Barometer Means for all Oceans.

The work for the four months, February, May, August, and November, far advanced, and the means for a large number of coast stations on both sides of the North Atlantic obtained for use with the sea observations.

North Atlantic Weather Charts.

Correspondence with shipowners, local marine boards, harbour-masters, &c., at home and abroad inviting their co-operation in obtaining observations in the North Atlantic for 13 months from August 1st, 1882.

Daily examining the shipping lists, and despatching direct to captains supplies of Form No. 38, accompanied by circular letter No. 32. Acknowledging receipt of observations.

Visiting ships arriving in the Port of London, making extracts from their logs, and inviting the co-operation of the captains in the work.

Preparing Charts for August 1st to 10th, local and Greenwich noons, to aid the Council in deciding the time to be adopted.

The preparation of observations for further charting.

General.

Assisting in the discussion of sea temperatures for all oceans.

Indexing data in ocean 10° squares.

(Signed) CHAS. HARDING.

The Marine Superintendent.

PANTAGRAPH ROOM.

The usual summer vacation occurred in the interval covered by this report.

Copper plates pantagraphed:—22 plates, Nos. 52 to 73, 1877.

Zinc plates:—Barograms, 14 plates, Nos. 67 to 73, 1877, and 1 to 7, 1878; Thermograms, 13 plates, Nos. 68 to 73, 1877, and 1 to 7, 1878; Vapour tension, 18 plates, Nos. 61 to 73, 1877, and 1 to 5, 1878; Anemograms, 18 plates, Nos. 1 to 18, 1878; Rain curves, 30 plates, Nos. 62 to 73, 1877, and 1 to 18, 1878.

Photographic curves are prepared to Plate 18 (1878)] in the case of the barograms, but the thermograms are not in advance of the zinc plates.

The *harmonic analysis* of the temperature curves for 1873 has been completed, and six-sevenths of the curves for the year 1876 have also been passed through the instrument.

The *sunshine records* of 31 stations for the year 1881 have been pantagraphed upon zinc plates, and are now quite ready for the printer. The records from five stations had to be tabulated, and the tabulations of the remaining 26 stations checked, before the reduction could be commenced.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

SIR,

ON the 11th January 1881 I reported the state as "*equivalent to the completion of the work for September* 1880," or nearly three months in arrear.

To-day I have to report work *equivalent to half of February* 1882, or nearly eight months in arrear; an increase of five months in the 22½ months which have intervened.

In addition to the causes of delay enumerated in my last report, and which have continued, I would point out that various investigations on the change of the zero-lines from *upper* to *lower* and *vice versâ*, and many minor matters, formerly submitted to Mr. R. H. Curtis, entailing collectively considerable expenditure of time, have, since the separation of the branch from the Pantagraph Department, entirely fallen upon us.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., Secretary, Meteorological Council. (Signed) T. E. ALLEN.

Reported—That the following cheques for October were drawn on the 31st of that month:—

		£ s. d.	£ s. d.
Administration:			
R. H. Scott, salary		- - -	66 13 4
J. S. Harding, jun.	Salaries and wages	27 15 6	
T. D. Bell		14 8 10	
J. S. Harding, sen.		*4 9 10	
R. G. Canham		8 6 8	
			55 0 10
The Gas Light and Coke Co., gas		- -	1 10 1
Bank of England, account Stationery Office		- -	0 17 6
F. Hatchett, multiplex copying plates		- -	1 5 0
Pickford & Co., carriage of parcels		- -	1 3 11
Steel & Jones, newspapers		- -	1 2 6
W. Wightman & Co., printing, &c.		- -	3 17 0
Williams & Norgate, books		- -	1 1 10
Special Researches:			
Thos. De La Rue & Co., sun-cards		- -	17 10 0
Kew Committee, reduction of observations and verifications			23 0 0
C. E. Strachan, Arctic observations			2 5 0
R. Strachan, computing constants, for harmonic analyser (Minutes, p. 31)			11 0 0
Captain H. Toynbee, discussion of Cape gales (Minutes, 1880, p. 53)			50 0 0
Land Meteorology:			
E. E. Cobley, computations		- -	4 0 0
T. Cullcton, stencil plates		- -	1 7 4
Kew Committee, postages, &c.		- -	1 14 10
Meteorological Society, observations		- -	25 0 0
J. E. Cullum (Valencia), salary		- -	16 13 4
R. H. Curtis	Discussion, &c. of Observations.	22 4 5	
J. A. Curtis		15 11 1	
T. E. Allen		15 11 1	
C. H. Thompson		†9 14 0	
E. G. Aldridge		†7 16 8	
			70 17 3
Carried forward			£355 19 9

* Two weeks ending 14th October.

† Four weeks ending 28th October.

	£ s. d.	£ s. d.
Brought forward -	- -	355 19 9
Weather Information and Forecasts:		
F. Dangerfield, delivery of D.W. Charts -	- -	12 7 6
Postmaster General, telegrams - - -	- -	181 8 7
F. Gaster -	28 0 8	
F. J. Brodie -	22 4 0	
G. G. Francis - (Preparation, &c. of Weather Reports.)	20 10 0	
A. J. Rigby -	15 0 0	
R. Sargeant -	*12 6 8	
		98 1 4
Inspections:		
A. Buchan, travelling - - - - -	- -	36 8 9
G. W. Whipple, travelling - - - -	- -	38 14 9
Ocean Meteorology:		
Capt. H. Toynbee - -	33 6 8	
Nav. Lieut. C. W. Baillie, R.N.	20 16 8	
R. Strachan - - - (Discussion, &c. of observations and care of instruments.)	27 15 6	
C. Harding - - -	22 4 5	
H. Harries - - -	*11 14 0	
		115 17 3
W. Allingham, collection of synchronous observations	-	8 0 7
P. Adie, repairing "A" instruments - -	40 10 0	
„ „ "B.T." „ - -	2 1 6	
		42 11 6
Kew Committee, verifications - - -	14 0 0	
„ „ - - -	21 14 0	
		35 14 0
The "Nautical Magazine," advertisements -	- -	2 5 0
Pewtress & Co., printing - - -	- -	3 3 0
J. H. Woodstock, packing cases - -	- -	2 2 0
Miscellaneous:		
J. J. Hicks, commissions - - -	- -	1 15 0
Kew Committee, commissions - - -	- -	8 7 0
R. W. Munro, „ - - -	91 8 6	
„ „ - - -	8 0 0	
		99 8 6
J. S. Harding, jun., petty cash - -	- -	40 0 0
Total -		£1,082 4 6

The following cheques for weekly salaries were drawn on the dates specified :—

	£ s. d.
7th October - - - - -	27 14 1
14th „ - - - - -	27 12 1
21st „ - - - - -	27 12 1
28th „ - - - - -	27 12 1
	£110 10 4

* Four weeks ending 28th October.

116, *Victoria Street, November* 22, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 8) were read and confirmed.

Read—The following letter:—

M. 27076. FORMS.

Board of Trade (Marine Department),
Whitehall Gardens, November 15, 1882.

SIR,

I AM directed by the Board of Trade to request you to be so good as to move the Meteorological Council to favour them with a reply at their early convenience to the letter addressed to them from this Department on the 17th May last, relative to the revision of the paper headed "On "the Use of the Barometer to Seamen," by Captain Toynbee, contained in pages 28 to 41 of the Barometer Manual, which this Board proposes to reprint for the use of their examiners.

I am, &c.
(Signed) GEORGE J. SWANSTON.

The Secretary, Meteorological Office,
116, Victoria Street, S.W.

Mr. Scott was requested to prepare a draft Manual "On the Use of the Barometer to Seamen," in accordance with the wish expressed by the Board of Trade (Minutes, p. 23), and to inform the Board that such a work is in preparation.

Submitted—The following correspondence (Minutes, p. 4):—

I.

Meteorological Office, 116, Victoria Street, London,
May 16, 1882.

DEAR SIR,

As you are no doubt aware, a system of seven self-recording observatories has been now maintained by the Meteorological Office for more than 14 years; and the opinion has been expressed by some meteorologists of eminence that the time has arrived when this system should be revised, with a view to a considerable diminution in the number of the observatories.

I venture to ask you as a great favour, to communicate to me any opinion which you may be led to form as to the question thus raised.

The funds annually placed at the disposal of the Meteorological Council by Her Majesty's Government are strictly limited in amount; on the other hand, the Council is allowed considerable latitude in the appropriation of their annual grant.

Under these circumstances the question of the continued maintenance of the observatories presents itself to the Council, as turning, not on the desirability in itself of the continuance of the present system, but on the importance of that object as compared with other branches of meteorological work.

If any of the observatories were suppressed, the funds thus liberated would not be lost to meteorology, but would be applied to other purposes of recognised importance, such as—

(1.) The more complete discussion of the continuous records already obtained;
(2.) Extensions of the existing arrangements for the synoptic study of weather;
(3.) Experimental researches on the physical problems of meteorology; or
(4.) The more complete equipment of such of the observatories as might be retained.

And it is felt by the Council that the cost of the seven observatories encroaches perhaps unduly on the funds which would be available for these or similar purposes.

It has been suggested that the number of observatories might be reduced to three; one at Kew, one at Valencia, one at Aberdeen, or some place in the north of Scotland; these three points forming a nearly equilateral triangle which covers a great part of the United Kingdom.

I shall be greatly obliged to you if you could inform me whether, in your opinion, three self-recording observatories, supported of course by stations of the second order, would be sufficient to furnish an adequate continuous record of the climate of the British Isles; and if you should think the number three insufficient, whether any smaller number than seven would, in your judgment, suffice.

I am addressing a letter in similar terms to————

ANY reply with which you may favour me will be regarded as confidential, and as for the use of the Meteorological Council only.

I have, &c.
(Signed) HENRY J. S. SMITH,
Chairman of the Meteorological Council.

To Messrs. Eaton, Hann, and Wild.

M.O. 1393. Ia.

Bridy Lodge, Chepstow Road, Croydon,
June 19, 1882.

DEAR SIR,

I AM much honoured by your letter of the 16th ultimo. in which you ask my opinion as to the continued maintenance of the seven self-recording observatories of the Meteorological Council.

I think you are right in proposing to reduce their number, and this may be done without prejudice to the progress of meteorology, the period of 14 years during which they have been in operation being certainly long enough to afford approximate constants for determining the climate of the British Isles.

But, of three stations which it is proposed to retain, I would suggest that, while Kew and Valencia should be continued, as affording special types of climate, a station in the Shetland Islands, or better still in the outer Hebrides, as far removed as possible from the influence of land, would be preferable to Aberdeen. My reason is this: an examination of the observations taken at Aberdeen does not disclose any special feature in the climate of that place, which seems to be dominated by the mainland of Scotland; but the localities I have named are much nearer the ordinary path of storms coming from the Atlantic, and observations at either of them would better illustrate the phenomena of cyclones undisturbed by land, and be of higher interest to meteorologists. On this account I am of opinion that the additional expense which would be incurred in the establishment and maintenance of a first order station in so remote a district would be justifiable.

As to the appropriation of the funds which would be at the disposal of the Meteorological Council on the suppression of four of the self-recording observatories, I consider it most desirable to devote a portion to ascertain the diurnal variation of atmospheric pressure, temperature, and moisture, at all the observatories, for each month of the whole series of years, as the results would be available for a more complete discussion of the observations of these elements made at the second order stations scattered over the country.

But before proceeding further with the reduction of the anemometrical records, there are one or two points which I think should be seriously considered. In the first place it seems very doubtful whether the observations at one station are comparable with those at another, especially of the velocity of the wind. Apart from the question of the value to be assigned to the velocity deduced from the revolutions of the cups in Robinson's anemometer, which is not yet settled, the exposure of the instruments differs; they are at various elevations above the ground, and above the structures on which they are erected, and the friction must therefore be variable and vitiate the comparative values.

Another portion of the funds set free by the proposed changes might accordingly be spent with advantage in erecting anemometers—pressure plates as well as cups—on well-stayed masts, such as are in use for railway signalling, 60 or 80 feet high, and these in conjunction with the present anemographs would probably enable the observations hitherto taken to be more fully utilised, and in future help the solution of the vexed question of the dimensions of gusts of wind. The establishment of additional anemographs at Kew, Valencia, and a third station, and the more complete discussion of the continuous records of the barometer and dry and wet bulb thermometers already obtained, would probably absorb the funds at the disposal of the Meteorological Council. Should any surplus remain, I think it might be devoted to an attempt to ascertain, by means of kites, the conditions of the mass of air involved in cyclonic disturbances and high-pressure areas, especially as regards temperature, humidity, and the movement of air currents; and that, in pursuing inquiries in this direction, to secure the greatest prospect of success, the Council might extend some assistance to private enterprise by the loan of instruments and apparatus.

With respect to extension of the existing arrangement for the synoptic study of weather Although desirable in itself, I imagine that any one working on the subject would avail himself of current foreign publications, and I therefore think it inexpedient to incur increased expenditure on this head at present.

I have, &c.

Professor Henry J. S. Smith,
Chairman of the Meteorological Council.

(Signed) HENRY STORKS EATON.

II.

DEAR SIR,

I HAVE great pleasure in answer to your invitation in stating my opinions as to the advisability of reducing the number of your seven observatories.

I think that three observatories of the first order, Valencia, Kew, and a third in the north of Scotland ought to suffice for permanent service. The materials which have already accumulated from the seven observatories should certainly suffice for the investigation of the daily march of the principal elements of meteorology.

If I were in the place of the Meteorological Council and had to decide this point I should certainly, in view of the great expense of seven observatories, preserve only three, one in each kingdom, and abolish four of them, as soon as they had yielded material enough to solve the problems of local climatology.

I should, however, maintain these points as stations of the second order, for observations to be made two or three times daily, if there do not exist in their vicinity stations of that class in similar situations.

Eventually, if funds were readily available, I should erect at each of the seven observatories simple mechanical barographs (Höttinger's or Kreil's, at a cost of about 20*l.*), in order to trace the progress of barometrical waves in special cases, and should also leave the anemometers in action. I should not, however, reduce the records fully, but simply use them to trace easily the history of storms and squalls, in short to facilitate the study of extraordinary atmospherical phenomena.

The apparatus mentioned does not require further attention than the insertion of, and the dating of, the papers, so that the cost of maintenance could not be high.

I should not continue the records of temperature or humidity, but should possibly keep up that of rain, if that is mechanical and does not involve much expense or trouble.

I am at present gradually establishing at various points in the Austrian Empire the very simple barographs of Höttinger (Zürich) which are very convenient, and not only enable us to trace the progress of barometrical minima, but lead to the easy detection of errors in reading the mercurial barometer at the regular hours of observation.

I fully approve of the proposal that the funds set free by the suppression of four of the observatories should be primarily devoted to the complete reduction and discussion of the material already accumulated from the entire seven, and secondarily to meteorological investigations of the modern type (*Zeitgemäss*) and with a different object such as synoptic studies [with the help of mean values for long periods, on the basis of monthly means] embracing large areas of the earth's surface—problems of physical meteorology—the establishment of stations of the second order at points where they would be desirable for synoptic work or for the investigation of special local peculiarities of climate.

I do not know if it would fall within the sphere of operations for the Council to establish stations outside the United Kingdom, but if it did I would venture to direct their attention to the want of permanent stations in the equatorial regions, on some points on the coasts of Africa and America and in the islands of the Pacific.

I am, &c.

Professor H. J. S. Smith. (Signed) J. HANN.

III.

DEAR SIR,

THE question of the possible reduction of the number of the automatic observatories in the British Isles is in its nature of such importance to the science of meteorology in general, that I have felt much difficulty in answering it.

It would of course be in itself desirable for the investigation of the climate of a country to maintain as many stations in it provided with self-recording instruments as is possible. Unfortunately, however, the funds available for meteorological inquiry are, in almost all cases, so limited that they will only suffice to meet a certain proportion of the demands made on them. Under these circumstances, therefore, we must from time to time devote our energies to such inquiries and discussions as appear the most urgent and important for the progress of the science at the time.

If from this point of view we consider the number of automatic observatories whose maintenance in a country is necessary, we shall certainly be led to recommend that this number should be limited in comparison with what may be deemed desirable.

Almost without exception, the only scientific use which has been made of these frequent or continuous observations has been to deduce the diurnal range of each element, and thence to determine the corrections applicable to the observations taken at regular intervals, in order to obtain true daily means. Nay more, in view of the very small number of such stations in most countries, it would be impossible to utilize their observations in any other direction.

The disproportionate expense which the maintenance of such stations involves, appears to me, in consideration of the impossibility of discussing their results in all directions, to indicate the necessity of reducing their number to such an extent as to render it possible to carry out the speedy and complete discussions of their records in the way above indicated.

As to the United Kingdom in particular, I am of opinion that, as the seven observatories have been at work for 14 years, they have yielded material sufficient to exhibit the diurnal range of the principal elements for all parts of the British Isles, and that the time has come for reducing them to about three, so as to set free funds for the discussion of the records collected, and for the treatment of other important subjects in our science. Three such observatories in your country ought to be enough to enable you to trace extraordinary phenomena in the same detail as is done elsewhere, and to complete the materials for the study of diurnal range.

I am, &c.

To Professor H. J. S. Smith. (Signed) H. WILD.

Mr. Scott was instructed—(1.) To prepare a detailed report as to the cost to the Office of the self-recording observatories, including the maintenance of the observatories themselves, and the subsequent discussion of the records.

(2.) To obtain information as to the cost of mechanical self-recording instruments, both of a rougher and of a more perfect kind.

Read—A letter (No. 2546) from Mr. E. J. Lowe, F.R.S., requesting the Council to express an opinion with reference to his proposal, that an observatory should be established at Shirenewton, near Chepstow (Minutes, 1880, p. 40).

The Chairman was requested to send the following reply:—

SIR,

IN reply to your letter of the 25th of September I am requested by the Meteorological Council to inform you that they would view with satisfaction the establishment of a permanent meteorological observatory, of the first order, in connexion with the ports of the Bristol Channel.

The site proposed by you has been inspected by Mr. Scott, the Secretary of the Council, who has reported to them that it offers great advantages.

If the observatory should be established, the Council would be glad to advise as to its equipment; and as the observations received from it would be highly useful in the work of the Office, they would be ready to publish returns from it, if made in accordance with the system adopted by the Office, and would undertake to have it regularly inspected.

I remain, &c.

To E. J. Lowe, Esq. (Signed) HENRY J. S. SMITH.

Reported—That the comparison between the results derived by calculation from Mr. Eaton's figures and those obtained by means of the harmonic analyser for the year 1876 (Minutes, p. 31) had been completed for four observatories for the dry-bulb thermometer. The values of the seven constants, plotted as curves, for the observatories of Aberdeen and Valencia were submitted.

The agreement was found to be satisfactory, and it was resolved—That the same curves be plotted for the other observatories, and that the results be published in the Quarterly Weather Report for 1876.

The attention of the Council was called to the increasing arrears of work in the Examination Room, and Mr. Scott was requested to bring the matter before the Council at the next meeting.

Submitted—Five charts of the North Atlantic (Minutes, p. 43) with the air-temperature observations plotted and isotherms drawn for local noon and for Greenwich noon respectively.

Resolved—That the local noon temperatures be plotted on the charts, the difference between the observations at local noon and at 8 a.m. local time being also entered.

Reported—That the landlord of the premises occupied by the Office had consented to cancel the lease of the rooms at No. 113, Victoria Street, and to let to the Council the uppermost floor of No. 116 at a rent of 105*l.* per annum (Letter 2536).

Mr. Scott was instructed—(1.) To make such arrangements with respect to alterations and furniture as may be necessary for the immediate occupation of the new rooms.

(2.) To engage two female assistants to be employed in plotting the Atlantic charts.

(3.) To place on the roof such meteorological instruments as it may be from time to time thought desirable to have in immediate connexion with the Office.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting five logs had been received, four of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. T. A. Broadfoot.	S.S. "Cipero" -	Aug. 6—Nov. 8, 1882.	Glasgow to Demerara and home.	1882, p. 41.
Capt. T. L. Grainger	S.S. "Manora" -	July 7—Nov. 8, 1882.	Plymouth, Brisbane, and home, viâ Suez.	—
Capt. H. Manning -	S.S. "Seine" -	Sept. 19—Nov. 5, 1882.	Repairing cables in the Atlantic.	1882, p. 18.
Capt. W. J. L. Wharton, R.N.	H.M.S. "Sylvia"	May 6—Sept. 6, 1882.	Plymouth to Monte Video, and surveying there.	1881, p. 134.

Mr. Scott was instructed to present the Charts (O. 27) to Captain Grainger, and to convey the best thanks of the Council to the other observers.

Read—Letter 2523 from the Royal Astronomical Society, suggesting that in the logs issued instructions for the observations of comets should be inserted.

Captain Toynbee submitted a draft of such instructions, which were approved and ordered to be issued in the form of a loose slip to be inserted in the logs.

The Hydrographer submitted experimental rainfall maps, as requested (Minutes, p. 41).

It was resolved to insert in the Meteorological Atlas of the British Isles a rainfall map founded on the maps now submitted.

Submitted—The following report on the forecasts for the month of June 1882 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentages of Success a + b.
Scotland, N.	a	46	46	46	73
,,	b	27	27	27	
,,	c	15	19	17	
,,	d	12	8	10	
Scotland, E.	a	42	35	39	77
,,	b	35	42	38	
,,	c	15	19	17	
,,	d	8	4	6	
England, N.E.	a	50	50	50	79
,,	b	27	31	29	
,,	c	15	11	13	
,,	d	8	8	8	
England, E.	a	54	50	52	85
,,	b	38	27	33	
,,	c	4	15	9	
,,	d	4	8	6	
Midland Cos.	a	58	38	48	83
,,	b	31	38	35	
,,	c	4	12	8	
,,	d	7	12	9	
England, S.	a	62	38	50	81
,,	b	19	42	31	
,,	c	15	12	13	
,,	d	4	8	6	
Scotland, W.	a	38	46	42	82
,,	b	42	38	40	
,,	c	12	4	8	
,,	d	8	12	10	
England, N.W.	a	46	31	39	79
,,	b	31	50	40	
,,	c	19	15	17	
,,	d	4	4	4	
England, S.W.	a	46	27	37	87
,,	b	46	54	50	
,,	c	8	11	9	
,,	d	0	8	4	
Ireland, N.	a	46	62	54	89
,,	b	42	27	35	
,,	c	0	4	2	
,,	d	12	7	9	
Ireland, S.	a	35	58	47	89
,,	b	46	38	42	
,,	c	11	4	7	
,,	d	8	0	4	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentages of Success a + b.
Scotland, N.	a	47	43	45	78
,,	b	33	33	33	
,,	c	7	17	12	
,,	d	13	7	10	
Scotland, E.	a	57	50	54	81
,,	b	20	33	27	
,,	c	17	14	15	
,,	d	6	3	4	
England, N.E.	a	64	57	61	89
,,	b	23	33	28	
,,	c	10	7	8	
,,	d	3	3	3	
England, E.	a	64	27	46	91
,,	b	30	60	45	
,,	c	3	10	6	
,,	d	3	3	3	
Midland Cos.	a	63	54	59	84
,,	b	27	23	25	
,,	c	7	20	13	
,,	d	3	3	3	
England, S.	a	77	47	62	87
,,	b	17	33	25	
,,	c	6	13	10	
,,	d	0	7	3	
Scotland, W.	a	54	40	47	82
,,	b	33	37	35	
,,	c	10	7	9	
,,	d	3	16	9	
England, N.W.	a	53	43	48	82
,,	b	27	40	34	
,,	c	13	10	11	
,,	d	7	7	7	
England, S.W.	a	60	30	45	86
,,	b	34	47	41	
,,	c	3	20	11	
,,	d	3	3	3	
Ireland, N.	a	30	67	49	88
,,	b	50	27	39	
,,	c	10	3	6	
,,	d	10	3	6	
Ireland, S.	a	47	60	54	88
,,	b	40	27	34	
,,	c	10	7	8	
,,	d	3	6	4	

Summary.

British Isles	a	47	44	46	82
,,	b	35	38	36	
,,	c	11	11	11	
,,	d	7	7	7	
British Isles	a	56	47	52	85
,,	b	30	36	33	
,,	c	9	12	10	
,,	d	5	5	5	

General Strachey submitted the following note (Minutes, November 8) :—

Note on the Report on the Meteorology of Kerguelen.

The result of Mr. Ellis's revision of Mr. Perry's work is to show that the barometrical and thermometical reductions of the "Erebus" and "Terror" observations have been made by Mr. Perry with practically satisfactory accuracy, the numerical results obtained by Mr. Ellis being very slightly different from those shown in the printed volume.

Mr. Perry, however, has omitted to introduce the correction of the daily inequalities rendered necessary by the change from the commencement to the end of the periods for which means are calculated.

Office

Mr. Ellis has, I think, committed a slight oversight, of no practical importance indeed, by comparing for the purpose of this correction the *initial 1 a.m.* observation with the *final midnight* observation instead of the two midnight observations, the one preceding the series and the other ending it. He also would, I think, have done better by taking the mean of 25 hourly means, including the preceding midnight for each day, and thus obtaining a mean for noon, instead of for half-past 12, which is the result if the 24 hours from 1 a.m. to midnight are used. The differences between the results on the two systems are, however, quite insignificant.

Mr. Ellis also has omitted to introduce this correction in the temperature tables, though it would be sensible, and would tend to remove a small apparent anomaly.

It seems doubtful whether it is worth while to print Mr. Ellis's work *in extenso*, and a notice stating the general results he obtained would suffice.

He discards as unworthy of notice the hygrometric observations. They are rendered difficult of apprehension, in respect of their reliability, by being presented in the form of *per-centage of humidity*, which introduces a double cause of error from the uncertainties both in the observed dew point and air temperature from which the calculations are made. Possibly more consistent results might have been got from the calculation of the tension only.

The above remarks apply only to the "Erebus" and "Terror" observations. As to the others, Mr. Ellis has not examined them, and there is nothing to show how Mr. Archibald treated them. If a correction for the change during the several periods for which the means are calculated is shown to be necessary, it might be easily calculated, and be inserted in the notice which would deal with Mr. Ellis's revision.

22nd November 1882. R. S.

Reported—That Mr. F. T. Bullen had been engaged in the Marine Room from the 13th inst., at a salary of 2*l.* per week.

116, *Victoria Street, December* 6, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	GENERAL STRACHEY.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 22) were read and confirmed.

Resolved—That the suggestions in General Strachey's memorandum on the Report on the Meteorology of Kerguelen be adopted, and that a list of corrections be prepared for publication (Minutes, 1880, p. 17).

Submitted—The curves exhibiting the comparison between the results obtained by the harmonic analyser and by calculation from the records of the remaining observatories (Minutes, November 22).

Professor Stokes was requested to prepare an explanatory memorandum of the results obtained, to accompany the plates when printed in the Quarterly Weather Report.

Reported—That the agreement for renting the uppermost floor of the house had been signed on the 29th ultimo.

Read—A memorandum from Captain Toynbee reporting that since the last meeting three logs had been received, one of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. A. Becket -	"Amana" -	Feb. 6—Nov. 13, 1882.	London, Adelaide, Rangoon.	1878, p. 49.

Mr. Scott was instructed to convey the best thanks of the Council to Captain Becket.

Reported—That Captain Toynbee suggested the appointment of Mr. L. Allen, teacher of the Navigation School at Dundee, as agent for that town, in place of Mr. P. Feathers (Letter 2634). Approved.

Read—Letter 2450 from Mr. Ley, suggesting that the wind reports from Prawle Point be used in the Daily Weather Maps instead of those from Hurst, as the latter are affected by local influences.

Resolved—That the register kept at the Needles Lighthouse be procured from the Trinity House for comparison with the wind reports from Hurst, and that the results be submitted to the Council.

Read—Letter 2255 from the Stationery Office, requesting the Meteorological Office to pay the amount of 26*l.* 6*s.* 1*d.*, being the extra charges in Messrs. Malby's account for printing the Index Charts of the Meteorology of the Cape District.

Resolved—That the amount be paid.

Read—Letters 821 and 2368 from Kew Observatory, relating to the actinometric observations at Kew (Minutes, 1881, p. 138), and stating that the charge for the observations would be 1*s.* 6*d.* per hour.

The Secretary was authorised to accept the estimate. The subject was referred to General Strachey,—the observations to be submitted to him.

Mr. Scott was instructed to write to Captain Noble, inquiring whether arrangements are in progress for continuing the experiments on shell firing at Shoeburyness, (Minutes, p. 24), and what further immediate grant (if any) would be required for the purpose.

Hay Harvest Forecasts, 1882.

Sir,

I beg to submit herewith a report on the Hay Harvest Forecasts for 1882.

The issue of these forecasts commenced with those for "England N.E., E., Midland Counties, "England S. and S.W." on the 12th June; as the season advanced those for the other districts were added, and the issue terminated generally on August 12th with "Scotland N." Most of the districts received the telegrams daily (except on Sundays) for a space of about five weeks, but in the case of "England S.W." they were continued for an additional fortnight by a special request of the observers. In the neighbourhood of Knutsford the forecasts were so fully appreciated that they were continued at the expense of the Hon. P. Egerton for an additional period of four weeks.

The result of the checking shows that the total percentage of success (87) is much larger than in either of the preceding years during which the hay harvest forecasts have been issued, and also that the proportion of *completely* successful forecasts is decidedly greater than it has hitherto been. The largest total percentages of success were reached in "England N.W." and "Ireland S.," for which districts the value was 92, while the smallest proportion (80) was in "England E." and "Ireland N."

The following is a brief resumé of the larger table on p. 67:—

Summary of Results.

Districts.	Names of Stations.	Percentages.				Total Percentage of Success.
		Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
Scotland, N. - -	Golspie and Drynie - -	48	35	15	2	83
Scotland, E. - -	Glamis and Longniddry - -	57	31	10	2	88
England, N.E. -	Morpeth and Ulceby - -	40	46	12	2	86
England, E. - -	Thorpe and Rothamsted - -	56	24	18	2	80
Midland Counties -	Cirencester and Gerrard's Cross -	45	45	8	2	90
England, S. - -	Maidstone and Downton -	53	35	9	3	88
Scotland, W. -	Islay and Drymen - -	41	49	6	4	90
England, N.W. -	Leyburn, Prescot, and Knutsford	51	41	8	—	92
England, S.W. -	Bridgend (Glamorgan), Falfield, Clifton, and Glastonbury.	47	41	10	2	88
Ireland, N. - -	Antrim, Hollymount, and Moynalty.	47	33	14	6	80
Ireland, S. - -	Moneygall, New Ross, and Ardfert Abbey.	63	29	8	—	92
	Mean for all districts, 1882 -	50	37	11	2	87
	„ „ 1881 -	29	47	21	3	76

The remarks made by Mr. Smith (for the Hon. P. Egerton) and by Mr. Mitchell, of Drynie, Inverness, are worthy of note (see remarks on detailed table).

I am, &c.

(Signed) Fredc. Gaster.

To R. H. Scott, Esq.,
Secretary, Meteorological Council.

RETURN showing the NUMBER of FORECASTS sent to each of the under-mentioned PERSONS, with the SUCCESS or otherwise of the FORECASTS.

Districts.	To whom sent.	Addresses.	No. of Forecasts sent.	No. of Forecasts checked.	Percentages.				Remarks.
					Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
0. SCOTLAND, N.	— Melville, for the Rev. Dr. Joass.	Dunrobin Gardens, Golspie	30	30	36·7	43·3	16·7	3·3	
	J. R. Mitchell	Drynie, Inverness	30	29	58·6	27·6	13·8	—	Mr. Mitchell says: "Reports very correct on the whole, except that thunderstorms are not foretold."
1. SCOTLAND, E.	W. S. Macdonald	Craigielaw, Longniddry	30	29	55·2	[illegible]	[illegible]	3·5	
	G. Johnstone	Glamis, by Forfar	30	29	58·6	[illegible]	[illegible]	—	
2. ENGLAND, N.E.	J. Wilson	Woodhorn Manor, Morpeth	30	29	34·5	51·7	10·3	3·5	
	J. Turner	The Grange, Ulceby	30	29	44·8	41·4	13·8	—	
3. ENGLAND, E.	W. Birkbeck	Thorpe, Norwich	30	29	51·7	31·0	13·8	3·5	
	Sir J. B. Lawes, B.L.	Rothamsted, Harpenden	30	23	60·8	17·4	21·8	—	
4. MIDLAND COUNTIES	Professor Ohm	Royal Agricultural College, Cirencester.	30	29	58·6	34·5	6·9	—	
	Charles King, for the Duke of Somerset.	Gerrard's Cross, Bucks	30	23	30·4	56·5	8·7	4·4	
5. ENGLAND, S.	C. Whitehead	Barming House, Maidstone	30	29	55·2	31·0	6·9	6·9	
	E. P. Squarey	The Moot, Downton, Wilts	30	29	51·7	38·0	10·3	—	
6. SCOTLAND, W.	J. S. R. Ballingal	Eallabus, Bridgend, Islay	30	22	40·9	45·5	9·1	4·5	
	C. H. H. Wilsone, of Dalnair.	Endrick Bank, Drymen	30	29	41·3	51·7	3·5	3·5	
7. ENGLAND, N.W.	G. W. Wray	Leyburn, Yorkshire	30	29	51·7	34·5	13·8	—	
	F. Harrison, for the Earl of Derby.	Knowsley Gardens, Prescot	30	29	55·1	38·0	6·9	—	
	J. F. Smith, for the Hon. P. Egerton.	Tatton Park, Knutsford	58	29	44·8	51·7	3·5	—	Mr. Smith says that the forecasts were looked for by all the residents, and that they have been a great boon to the farmers. Letter 1786, 1882.
8. ENGLAND, S.W.	R. Neville	Butleigh Court, Glastonbury	42	30	53·3	40·0	6·7	—	
	J. Harle, for the Earl of Ducie.	Whitfield, Falfield, R.S.O.	42	41	51·2	36·6	9·8	2·4	
	T. Dyke	Long Ashton, Clifton, Bristol	42	41	36·6	41·5	19·5	2·4	
	Colonel J. B. Turberville.	Ewenny Priory, Bridgend, Glamorgan.	42	41	46·3	48·9	4·8	—	
9. IRELAND, N.	W. M. Kirk, per J. Hanson.	The Bush, Antrim	30	29	31·0	44·8	20·7	3·5	
	Rev. A. Brown	The Manse, Hollymount, Co. Mayo	30	29	55·1	20·7	13·8	10·4	
	C. C. Hamilton	Cherrymount, Moynalty, Co. Meath	30	29	55·1	34·5	6·9	3·5	
10. IRELAND, S.	W. Bradshaw, for T. Crosbie, Esq.	Ardfert, Co. Kerry	30	29	75·9	13·8	10·3	—	
	D. A. M'Cready	Larchvale, Moneygall, King's Co.	30	29	62·0	38·0	—	—	
	D. A. Millward	Kilkenny	30	30	50·0	36·7	13·3	—	

SUBMITTED—The following STATEMENT respecting the RECORDS for November 1881, received from the SELF-RECORDING OBSERVATORIES (see Minutes, 21st December 1868, and 20th November 1876).

—	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
ANEMOGRAPH:—	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.	Direction. Good.	Velocity. Good.
Action														
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ other causes	*47 hrs.	*49 hrs.	0	0	0	0	0	0	0	0	†2 hrs.	†2 hrs.	0	0
Orientation verified	26th	—	29th	—	17th	—	0	—	7th	—	23rd	—	0	—
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	1	0	0	0	0	0
„ „ irregular differences	0	0	0	0	2	2	81	48	3	2	1	5	0	0
Result of 40 *Remeasurements*:—														
Greatest difference	1·0	2·0	0·0	1·0	1·0	1·0	2·0	2·0	1·0	1·0	0·0	2·0	1·0	2·0
Mean difference irrespective of sign	0·0	0·6	0·0	0·5	0·1	0·3	0·3	0·6	0·1	0·4	0·0	0·3	0·1	0·7
Residual difference (—Meteorological Office)	0·0	0·0	0·0	+0·3	0·0	0·0	—0·2	—0·1	0·0	0·0	0·0	0·0	+0·1	0·0
RAIN GAUGE:—														
Action	Indifferent.		Good.		Good.		Good.		Good.		Good.		Good.	
Records deficient, due to stoppage of clock	0		0		0		0		0		0		8 hrs.	
„ „ other causes	0		0		§25 hrs.		0		0		0		0	
Errors in tabulation	0		0		0		5		0		2		0	

BAROGRAPH :—

Action	Good.	Good.	Good.	Good.	Good.	Good.	Good.
Photography	Do.	Do.	Do.	Bad.	Do.	Do.	Indifferent.
Records deficient, due to stoppage of clock	0	0	2 hrs.	0	0	0	9 hrs.
„ „ failure of light	0	0	0	20 hrs.	0	1 hr.	0
„ „ other causes	‡4 hrs.	0	0	0	0	.0	0
No. of errors discovered—							
In entry of standard	0	2	2	0	7	2	1
„ calculating residual correction	1	1	1	3	4	0	0
„ applying residual correction	1	1	0	30	8	2	0
„ subtraction in subsidiary tables	0	1	0	1	0	2	1
„ tabulation by subsidiaries	0	1	0	0	0	0	0
„ „ irregular differences	0	5	0	0	2	0	4
Result of 40 Remeasurements :—							
Greatest difference	·005	·006	·005	·005	·005	·005	·006
Mean difference irrespective of sign	·002	·002	·002	·002	·002	·003	·002
Residual difference (—Meteorological Office)	·000	·000	+·001	—·001	—·002	·000	·000
Mean monthly difference between simultaneous barograph and barometer readings	·002	·003	·001	·002	·002	·001	·002

THERMOGRAPH :—

Action	Good.		Good.		Good.		Good.		Good.		Good.		Good.	
Photography	Do.		Do.		Indifferent.		Bad.		Do.		Do.		Indifferent.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Records deficient, due to stoppage of clock	0	0	0	0	9 hrs.	9 hrs.	0	0	0	0	1 hr.	1 hr.	0	0
„ „ failure of light	0	0	0	0	0	0	0	0	0	0	0	0	0	0
„ „ imperfectly moistened bulbs	—	5 hrs.	—	0	—	10 hrs.	—	0	—	0	—	26 hrs.	—	0
„ „ partially frozen bulbs	—	0	—	0	—	0	—	0	—	3 hrs.	—	0	—	0
„ „ other causes	0	0	0	0	†1 hr.	†1 hr.	0	0	0	0	0	0	0	0
No. of errors discovered in entry of standard	0	0	1	1	0	0	0	3	0	0	0	0	0	0
„ „ by subsidiary measurements	0	0	0	0	0	0	0	0	1	0	0	0	0	0
„ „ of subtraction in do. tables	0	0	1	0	0	1	5	0	0	0	1	2	2	0
„ „ detected under glass scale	0	0	11	0	0	0	0	7	1	3	0	0	39	4
Result of 40 Remeasurements :—														
Greatest difference	0·2	0·2	0·3	0·2	0·2	0·2	0·2	0·4	0·2	0·3	0·2	0·2	0·4	0·3
Mean difference irrespective of sign	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
Residual difference (—Meteorological Office)	—0·1	+0·1	—0·1	0·0	+0·1	0·0	+0·1	—0·1	—0·1	—0·1	+0·1	0·0	+0·1	0·0
Mean monthly difference between simultaneous thermograph and thermometer readings	0·1	0·2	0·2	0·1	0·1	0·1	0·2	0·2	0·1	0·1	0·1	0·1	0·2	0·2
No. of errors in maxima and minima	0	—	6	—	0	—	4	—	4	—	2	—	14	—

* Instrument out of order. † Examining instrument. § Funnel pipe choked. ‡ Out of focus.

GLASGOW *Barograms* and *Thermograms* were retabulated at Observatory before examination.

Submitted—The following reports:

December 5, 1882.

STATEMENT of WORK in MARINE ROOM for November 1882.

Examined 12 new logs.

North Atlantic Weather Charts.

Staff engaged on weather observations in the North Atlantic from August 1, 1882.

Air isotherms for August 1 to 5 for local and Greenwich noons (10 charts) drawn for submitting to Council.

Examining shipping lists and forwarding observation forms to captains. Also acknowledging receipt of observations.

Visiting ships arriving in the port of London, making extracts from their logs, and inviting the captains to co-operate in the work.

Instructing a new clerk in his duties.

(Signed) CHAS. HARDING.
„ HENRY TOYNBEE.

The Marine Superintendent.

November 30, 1882.

STATEMENT OF WORK done in the PANTAGRAPH ROOM during November 1882.

Copper Plates pantagraphed:—11 plates, Nos. 1 to 9, 1878.

Zinc Plates:—Barograms, 7 plates, Nos. 8 to 14, 1878; Thermograms, 8 plates, Nos. 8 to 15, 1878; Vapour Tension, 7 plates, Nos. 6 to 12, 1878; Anemograms, 13 plates, Nos. 19 to 31, 1878.

Photographic Curves are prepared to Plate 25 (1878) in the case of the barograms; the thermograms are not ruled in advance of the zinc plates.

The plates for the second quarter of 1876 have been measured and checked.

Harmonic Analyser.—The Kew temperature curves for 1876 have been passed through the instrument; and the 1876 constants for all observatories worked out, and plotted for comparison with calculated results. The constants for 1873 have been worked out for five stations.

A defect in the Wagner Pantagraph discovered early in the month has been set right.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

December 1, 1882.

STATEMENT of WORK done in the EXAMINATION ROOM during the Months of July to November 1882.

SIR,

THE work for October and November 1881 has been completed, and the *Notes of Errors* sent to the various observatories.

The Kew *Thermograms* (December 1881–June 1882), and *Barograms* (December 1881–September 1882) having been required for the Annual Report, the examination was nearly completed for each month.

For the Registrar-General of Ireland's Quarterly Report, the work of Valencia and Armagh for the months of July and August 1882 has been completed, and for June and September 1882 partially so.

The following curves and tabulations have also been examined:—

October (1882): *Thermograms*, three stations; *Barograms*, three stations; *Anemograms*, one station.

During the period under notice the greater part of the annual vacation has been taken by the staff, and a considerable amount of my time has been occupied by subjects not included in the above.

R. H. Scott, Esq., M.A., F.R.S., Secretary, Meteorological Council. (Signed) T. E. ALLEN.

The following cheques for November were drawn on the 30th of that month:—

Administration:		£ s. d.	£ s. d.
R. H. Scott, salary		- -	66 13 4
J. S. Harding, jun.	Salaries and wages	27 15 6	
T. D. Bell		14 8 10	
R. G. Canham		8 6 8	
			50 11 0
Pickford & Co., carriage of parcels		- -	4 10 4
Bank of England, sale of Stationery Office forms		- -	2 2 9
Carried forward		- -	£123 17 5

	£ s. d.	£ s. d.
Brought forward -	- -	123 17 5
Special Researches:		
Kew Committee, radiation observations (Minutes, January 20)		6 12 9
T. A. Dorrien Smith, erecting Scilly anemometer	11 5 0	
„ „ strengthening Scilly anemometer (Minutes, 1878, p. 36) - -	5 14 5	
		16 19 5
C. E. Strachan, Arctic observations (Minutes, p. 31)	- -	1 16 0
R. Strachan, computations (Minutes, November 22)	- -	8 5 0
Land Meteorology:		
S. Call, extra duties after Dr. Robinson's decease (Minutes, p. 40), - - -	25 0 0	
S. Call, hourly observations while without gas (Minutes, November 8) - - -	1 10 0	
		26 10 0
E. E. Cobley, computations (Letter, M.O. 834/82)	- -	4 1 0
Hopkin & Williams, chemicals - - - -	- -	0 17 10
Johnson & Matthey, „ - - - -	- -	2 13 0
J. E. Cullum, salary - - - - -	- -	16 13 4
R. H. Curtis -	22 4 5	
J. A. Curtis -	15 11 1	
T. E. Allen - } Discussion, &c. of observations	15 11 1	
C. H. Thompson	*9 14 0	
E. G. Aldridge -	*7 16 8	
		70 17 3
Weather Information and Forecasts—		
Postmaster General, telegrams - - - -	- -	187 10 5
F. Gaster -	30 12 8	
F. Brodie -	19 13 0	
G. G. Francis - } Preparation, &c. of Weather Reports.	19 7 4	
A. J. Rigby -	15 0 0	
R. Sargeant -	*12 10 4	
		97 4
Ocean Meteorology:		
W. Allingham, collection of synchronous observations (Minutes, p. 43) - - - - - -	- -	8 18 4
D. MacGregor & Co., Glasgow agents - -	- -	13 3 7
Negretti & Zambra, "A" instruments -	23 7 3	
„ „ "B. T." „ - -	88 15 6	
		112 2 9
C. H. Permain, Southampton agent - -	- -	2 5 0
Captain H. Toynbee - -	33 6 8	
Nav. Lieut. C. W. Baillie, R.N.	20 16 8	
R. Strachan - - - } Discussion &c. of observations, and	27 15 6	
C. Harding - - - care of instruments.	22 4 5	
H. Harries - - -	*11 14 0	
		115 17 3
Miscellaneous:		
Galdea & Walker, commissions - - - -	- -	8 3 6
Negretti & Zambra, commissions - -	- -	29 0 6
J. S. Harding, jun., petty cash - -	- -	40 0 0
Total -	- -	£893 7 8

The following cheques for weekly salaries were drawn on the dates specified :—

	£ s. d.	£ s. d.
4th November - - -	27 12 1	
11th „ - - -	27 12 1	
18th „ - - -	29 12 1	114 8 4
25th „ - - -	29 12 1	

* Four weeks ending 25th November.

116, *Victoria Street, December* 20, 1882.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	LIEUT.-GENERAL STRACHEY.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (December 6) were read and confirmed.

Submitted—The following memoranda:—

MATERIALS for preparing ESTIMATES for the Year 1883–84.

	Estimated Expenditure. £ s. d.	Proposed for "Estimates" for 1883–4. £ s. d.
Administration:		
(1.) Council	1,000 0 0	1,000 0 0
(2.) Secretary	800 0 0	800 0 0
(3.) Salaries and Wages: Two clerks, office-keeper, messenger, and two boys	728 17 4	710 0 0
(4.) Rent, Fuel, and Lighting: Expenditure for one year ending 30th September 1882*	655 8 5	
Additional Rent	28 6 0	650 0 0
	683 14 5	
(5.) Incidental and contingent Expenses: Expenditure for one year ending 30th September 1882*	434 8 11	420 0 0
The alterations and fittings on the top floor will be chargeable to 1882–3.		
(6.) Pensions:— Mr. J. S. Harding, senior	42 16 5	43 0 0
Special Researches and Experiments	1,000 0 0	1,000 0 0
It is proposed that the salaries for additional clerks temporarily engaged for the Atlantic synchronous work should be charged under this head.		
Land Meteorology:		
(1.) Observatories and Stations: Expenditure for one year ending 30th September 1882*	2,531 17 0	
Deduct for some extra reductions done at extra time or outside office £30		
Add additional allowance to Armagh (say) £25	5 0 0	
	2,526 17 0	2,292 0 0
(2.) Discussion and Reduction of Observations: Eight clerks, one engraver, four boys	1,344 15 0	1,345 0 0
Carried forward		£8,269 0 0

* Minutes, 1881, p. 65; 1882, pp. 11 and 53.

Office

	Estimated Expenditure. £ s. d.	Proposed for "Estimates" for 1883-4. £ s. d.
Brought forward - -	- -	8,260 0 0
Weather Information and Forecasts:		
(1.) Telegraphic Reports and Storm Warnings:		
Expenditure for one year ending 30th September 1882* - - - - -	3,114 15 8	
Repayments during the same period* - -	618 14 5	
	2,496 1 3	2,520 0 0
Allowance made for continuance of bonus to telegraphic reporters (Minutes, 1878, p. 22).		
(2.) Preparation and issue of Reports and Forecasts:		
Seven clerks and two boys† - - -	1,487 8 0	
Assuming that the arrangement of June 1879 will be continued, and 50*l.* charged against "Research" - - - - -	50 0 0	
	£1,437 8 0	1,470 0 0
Inspections:		
Salaries and Expenses:		
Expenditure for one year ending 30th September 1882* - - - -	524 6 10	500 0 0
Ocean Meteorology:		
(1.) Discussion and Reduction of Observations:		
Marine Superintendent, assistant, six clerks, two writers, and one boy - - -	1,954 16 8	
Proportion chargeable to care and issue of instruments (say) - - - £200		
Assuming that the arrangement of June 1879 will be continued, and 100*l.* charged against "Research" - 100		
	300 0 0	
	1,654 16 8	1,670 0 0
(2.) Proportion chargeable to care and issue of instruments - - - - -	- -	200 0 0
(3.) Supply of instruments to Royal Navy:		
Expenditure for one year ending 30th September 1882* - - - - -	232 6 4	250 0 0
(4.) Supply of instruments to the Mercantile Marine:		
Expenditure for one year ending 30th September 1882* - - - - -	470 17 3	
The expense under this head varies much from year to year. The above amount includes for synchronous observations about £100		
The probable cost for collection of observations in 1883-4 will be at least - - - - 60	40 0 0	
	430 17 3	400 0 0
Carried forward - -	- -	£15,270 0 0

* Minutes, 1881, p. 65; 1882, pp. 11 and 53.

† Amount estimated from cost of quarter ending 30th September 1882 (Minutes 1882, pp. 50 and 53), on account of variations introduced by late evening and Sunday work.

	Estimated Expenditure.	Proposed for "Estimates" for 1883–4.
	£ s. d.	£ s. d.
Brought forward - - - -		15,270 0 0
Ocean Meteorology—continued.		
(5.) Distant Island (or Coast) Stations: Expenditure for one year ending 30th September 1882* - - - - - -	34 16 6	30 0 0
The *regular* charges under this head do not exceed 25*l.*, but the estimated amount is subject to fluctuation owing to the occasional supply of instruments.		
		£15,300 0 0

N.B.—The total of the estimated expenditure, shown by the figures in the first column, amounts to about 300*l.* in excess of the vote; the excess being chiefly in the Marine Department. Compensation has been made by a reduction in the branch for Land Meteorology, leaving other heads, generally, the same as before.

METEOROLOGICAL OFFICE: ESTIMATES for the Year 1883–84.

Heads of Service.	Proposed for 1883–84.		Voted for 1882–83.		1883–84. Increase.	1883–84. Decrease.
	£	£	£	£	£	£
Administration:						
Payment of Council - - -	1,000	- -	1,000			
Secretary - - - - -	800	- -	800			
Salaries and wages - - -	710	- -	710			
Rent, fuel, and lighting - - -	650	- -	650			
Incidental and contingent expenses -	420	- -	420			
Pensions - - - - - -	43					
		3,623		3,580	43	
Special Researches and Experiments -	- -	1,000	- -	1,000		
Land Meteorology:						
Observatories and stations - - -	2,292	- -	2,400			
Discussion and reduction of observations -	1,445	- -	1,480			
		3,737		3,880	- -	143
Weather Information and Forecasts:						
Telegraphic reports and storm warnings -	2,520	- -	2,520			
Preparation and issue of Reports and Forecasts - - - - - -	1,470	- -	1,470			
		3,990		3,990		
Inspections:						
Salaries and travelling expenses - -	- -	500	- -	500		
Ocean Meteorology:						
Discussion and reduction of observations -	1,670	- -	1,470			
Expenses incidental to the supply of instruments:						
Care and issue of instruments -	200	- -	200			
Royal Navy - - - -	250	- -	250			
Mercantile Marine - - -	300	- -	400			
Distant islands (and coast stations) -	30	- -	30			
		2,450		2,350	100	
Totals - - - -	- -	£15,300	- -	£15,300	£143	£143

The above estimates were accepted, and the Secretary was instructed to forward them to the Treasury (Letter 2660).

Submitted—The following report (Minutes, p. 62):—

GENTLEMEN,

I HAVE to report that I find the cost of self-recording aneroid barometers of best construction to be about 25*l.* Redier's mechanical siphon barograph costs 53*l.*, as I learn from Mr. Dowson, who lately purchased one (Letter 2603).

* Minutes, 1881, p. 65; 1882, pp. 11 and 53.

The cost of Van Rysselberghe's meteorograph is 5,000 francs, to which must be added 500 francs for the expenses of installation by the maker, who brings over the instrument personally. The total cost is therefore 220*l.* (Letter 2713.)

I have made inquiry from Mr. Preece as to the probable cost of continuous electrical registration of such an instrument in London from Penzance and Valencia, and he gives it at about 5,000*l.* a year (Letter 2659.)

To the Meteorological Council. (Signed) ROBERT H. SCOTT.

Mr. Scott was instructed to request M. Mascart to give information for the Council (Letter 2682)—

1. As to the forms of barograph and thermograph respectively, employed at the stations in connexion with the Bureau Central.
2. As to the price at which these instruments can be obtained.
3. As to the performance of the instruments, and the degree of accuracy to be expected from them.
4. As to the type of mechanically self-recording instruments which he considers to be the best.

In view of the proposal that four of the present self-recording observatories should be given up, Mr. Scott was requested to prepare reports showing at what stations it would be desirable, with a view of improving the forecasts and storm warnings, to place mechanically self-recording barometers.

Resolved—That a self-recording aneroid be procured, and its indications compared with the photographic barograms at Kew for one month.

Mr. De La Rue suggested that it might be feasible to adopt a process by which the photographic records should be rapidly developed, so as to be available for weather telegraphy, and undertook to communicate with Captain Abney on the subject (Letter 2637).

Read—Letter 2698, from Captain Noble (Minutes, December 6), stating that the experiments on shell firing would be shortly resumed, and that no further grant of money was required at present.

Read—Letters 2521 and 2769, from Captain Templer inquiring whether the Council contemplated any further experiments with balloons, and submitting an estimate for the cost of purchasing and working a captive balloon at Kew.

Mr. Scott was instructed to inform Captain Templer that the Council must wait until they have collected further information as to the observations proposed to be made in balloons.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting eight logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Lieut. Commanding R. F. Hoskyn and Lieut. H. Baker.	H.M.S. "Flying Fish."	Feb. 1—May 31, 1882.	Surveying in Japanese waters.	1882, p. 41.
Capt. C. M. Hepworth, F. J. Symons, 2nd officer.	S.S. "Danube"	March 4—Dec. 3, 1882.	Cape Town and South Africa.	1877 (Committee), p. 34.
Capt. W. H. Smith, R.N.R.	S.S. "Circassian"	March 30—Nov. 20, 1882.	Halifax and Quebec, eight voyages.	1881, p. 113.

Mr. Scott was instructed to present the Charts (O. 27) to Mr. Symons, and to convey the best thanks of the Council to the other observers.

Read—Letter 2767, from Mr. Cullum applying for a grant of 4*l.* 10*s.* for a mule-cart for the use of the observatory at Valencia (*vide* Mr. Scott's Report, Minutes, p. 46).—Sanctioned.

The Secretary was instructed to give the usual bonus of three guineas to the telegraphic reporters who had worked satisfactorily during the year.

Submitted—The following report (Minutes, p. 62) :—

REPORT of the COST of SELF-RECORDING OBSERVATORIES, including the MAINTE-RECORDS at

Year.	Stonyhurst.		Armagh.		Glasgow.		Aberdeen.		Falmouth.	
	Ordinary.	Outfit.	Ordinary.	Outfit.	Ordinary.	Outfit.	Ordinary.	Outfit.	Ordinary.	Outfit.
	£	£	£	£	£	£	£	£	£	£
1867–8	50	316	92	504	73	437	54	324	63	451
1868–9	205	16	155	53	256	42	250	229	274	18
1869–70	204	—	212	70	253	—	258	10	273	—
1870–1	215	32	176	82	262	37	266	48	279	33
1871–2	210	—	211	—	267	—	263	—	277	—
1872–3	211	—	186	—	262	—	265	—	276	—
1873–4	212	—	223	—	263	—	262	—	291	—
1874–5	213	—	228	—	264	—	273	—	277	—
1875–6	208	—	230	—	261	—	261	—	273	—
1876–7	206	—	215	—	255	—	258	—	272	—
1877–8	207	—	219	—	256	—	257	—	280	—
1878–9	233	—	242	—	297	—	274	—	294	—
1879–80	224	—	245	—	284	—	269	—	300	—
1880–1	225	—	228	—	277	—	276	—	290	—
1881–2	240	—	260	—	279	12	279	—	327	—
Totals - £	3,063	364	3,122	709	3,809	528	3,765	611	4,046	502
Summary £	3,427		3,831		4,337		4,376		4,548	

The above figures may be taken as *approximately* correct. The four columns for " Meteorological Office " contain the following items: 1*st column.* Alterations and Repairs of Pantagraphs, Copper and Zinc Plates, Ruling Zero Lines of Photograms (when done at Kew), Advertisements, Printing, Engraving, Smaller Tabulated Scales, &c. 2*nd column.* Pantagraphs, spare Self-Recording Instruments (at present lent to Oxford), Vapour Tension and Bagging Machines, larger Tabulating Instruments, &c. 3*rd column.* Cost of Examination for Errors in Tabulations (formerly done at Kew), Reduction by Pantagraphs and Preparation of Plates for publication, but not including work with Harmonic Analyser (charged to Special Researches). 4*th column.* Computation of Mean Results, Tabulations of Anemograms, Preparation of Hourly Observations for publication, &c. It also contains some items not referring to the Seven Self-Recording Observatories, as the work having been done both in regular and (formerly) extra official hours, the proportion relating specially to the Observatories cannot be easily separated.

NANCE of the OBSERVATORIES themselves, and the subsequent DISCUSSION of the the OFFICE.

Valencia.		Kew.		Meteorological Office.				Totals.	Year.
Ordinary.	Outfit.	Ordinary.	Outfit.	Ordinary.	Outfit.	Examination and Plates.	Computations.		
£	£	£	£	£	£	£	£	£	
190	663	350	875	—	—	—	—	4,442	1867–8
455	160	415	13	—	16	—	—	2,557	1868–9
511	5	472	91	12	92	—	377	2,840	1869–70
536	38	654	38	164	638	359	424	4,281	(1) 1870–1
514	—	655	—	144	220	447	360	3,568	(2) 1871–2
570	—	663	—	135	—	503	328	3,399	1872–3
548	—	668	—	120	—	550	234	3,371	1873–4
562	—	663	—	83	10	491	273	3,337	1874–5
490	—	658	—	90	—	572	284	3,327	1875–6
405	—	587	—	89	20	765	448	3,520	(3) 1876–7
471	—	422	—	63	—	888	320	3,383	1877–8
425	—	407	—	17	15	995	367	3,566	(4) 1878–9
443	—	404	—	55	80	1,060	347	3,711	(5) 1879–80
521	—	404	—	31	—	1,092	325	3,669	1880–1
462	—	418	—	57	—	1,125	352	3,811	(6) 1881–2
7,103	866	7,840	1,017	1,060	1,091	8,847	4,439	52,782	Totals and Summary.
7,969		8,857		15,437					

Explanation of above references:—

(1) Pantagraphic work began in July 1870, and the purchase of Pantagraphs and spare instruments falls in this year, also an additional allowance made to Kew.

(2) Vapour Tension and Bagging Machines purchased in 1871; there was also considerable extra expenditure in reducing Bermuda and Orkney Anemograms (about 130*l.* included in 4th Office column).

(3) A large amount of arrears both of Pantagraphic Work and Computation of Mean Results cleared off in year, partially by outside help.

(4) Some Salaries and the Annual Allowances to the Observatories increased.

(5) Some Salaries increased and a new Galton Pantagraph purchased.

(6) Increased expenditure at some Observatories and in the Pantagraph Branch.

ROBERT H. SCOTT.

116, *Victoria Street, January* 3, 1883.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | LIEUT.-GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (December 20) were read and confirmed.

Read—The following letter (Minutes, December 20) :—

Bureau Central Météorologique, 60, Rue de Grenelle,
(Cabinet du Directeur),
Paris, le 28 Décembre 1882.

MONSIEUR,

JE réponds d'abord à votre lettre relative aux instruments de météorologie :—

Barographes.—1°. Pour le baromètre nous employons soit l'enregistreur de Redier, soit l'enregistreur de Richard.

2°. Le premier est à mercure et rouage différentiel, il coûte environ 700 fr. ; les variations sont amplifiées cinq fois ; le second est aneroïde et coûte 100 fr. ; la courbe des variations n'est pas amplifiée.

3°. Ces deux instruments vont très bien ; celui de Redier donne facilement le $\frac{1}{20}$ de millim. ; l'autre permet d'évaluer les $\frac{1}{10}$ parceque la pointe traçante est très fine.

Remarque générale.—D'ailleurs, je ne considère pas les enregistreurs comme des instruments dont on doit exiger la précision absolue, ils me paraissent destinés uniquement à donner les variations ; une ou deux observations par jour donnent les termes de correction. Je sais bien qu'on a imaginé et construit des barographes dans lesquelles toutes les erreurs sont calculées ou compensées ; mais sans en faire aucune critique, je leur trouve le défaut capital de coûter très cher et d'être fort compliqués. Je préfère un contrôle journalier plutôt qu'une construction trop parfaite à laquelle on ne peut pas toujours attribuer un degré de confiance absolu.

Si un enregistreur de 100 fr. est détérioré, on en fait le sacrifice.

Ces petits instruments de Richard marchent tres bien à bord et j'en ai déjà placé quelques-uns sur les navires de commerce.

Thermographe.—Thermographe de Redier à tiges de métaux différents et rouage différentiel, 700 fr. ; thermographe de Richard avec tube courbe renfermant un liquide, 100 fr. Mêmes observations sur ces deux instruments que sur les baromètres.

Votre 4e question est moins claire. Quel type d'instruments mécaniques météorologiques je prefère ?

Je vous ai répondu pour le baromètre et le thermomètre. J'ajouterai que nous avons essayé un hygromètre à baudruche enregistreur de Richard dont nous sommes satisfaits.

En général, je cherche comme enregistreurs tout ce qu'il y a de plus simple, et des instruments distincts les uns des autres—j'ai horreur des instruments universels—et un contrôle fréquent pour chaque enregistreur.

Autant que possible, pas de transmission électrique. L'anémomètre est peut-être le seul instrument dans lequel une pareille transmission soit nécessaire.

Evitez aussi, autant que possible, l'enregistrement photographique. Il y a cependant des cas, comme pour l'électricité atmosphérique et le magnétisme où ce mode d'enregistrement est jusqu'à présent le seul possible.

Mais je sors peut-être beaucoup de vos questions et je me suis laissé entrainer à faire une sorte de profession de foi.

Il est bien entendu pourtant que cette manière de voir n'est relative qu'à la météorologie. Ce n'est pas, au moins dans mon esprit, une science de précision extrême. Le $\frac{1}{10}$ de millimètre est largement suffisant pour toutes les observations de baromètre ; je viens même de modifier les tables de correction publiées dans nos instructions, de manière que les corrections de température ne soient faites qu'au $\frac{1}{10}$ de millimètre près. Je sais bien qu'en faisant ainsi je n'entre pas dans les vues de tous les membres du Comité international, mais je crains que les erreurs n'en soient que plus grandes si on embarrasse les observateurs par des tables volumineuses.

Je crains bien que cette manière de voir ne me fasse passer auprès de certaines personnes pour un hérétique ; nous sommes heureusement à une époque où on ne brule plus les hérétiques.

Bien à vous,
(Signed) E. MASCART.

Mr. Scott reported (as requested at last meeting) that he would propose to place self-recording aneroids at the chief stations on the west and north coasts, viz., Scilly, Valencia, Mullaghmore, Stornoway, and Wick.

As regards Scilly, in view of the occasional interruption of communication, owing to damage to the cable, he was of opinion that it might be desirable to establish a station at the Land's End, in the event of the abolition of the observatory at Falmouth.

Read—A memorandum from Captain Toynbee reporting that since the last meeting five logs had been received, all of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last Mention on Minutes.
Mr. D. W. Barker, F.M.S., Chief Officer.	"Superb" -	Mar. 17—Dec. 26 1882.	London, Melbourne, and home.	1881, p. 134.
Capt. H. W. Dyke -	Barque "Markland."	July 19, 1881—Nov. 22, 1882.	Cardiff, Valparaiso, and home.	1881, p. 22.
Capt. A. W. Jeffery	S.S. "Ptolemy"	Oct. 7—Dec, 21, 1882.	Liverpool, Brazil, and New York.	1882, p. 42.
Capt. P. Murdoch -	"Sierra Estrella"	Mar. 27—Dec. 22, 1882.	Liverpool, Bombay, Rangoon, and home.	1881, p. 134.
Capt. W. H. Stuart	Sch. "Richmond"	Mar. 29—Aug. 1, 1882.	Tending lighthouses in Bahamas.	1880, p. 116.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Submitted—The following report:—

SIR, December 31, 1882.

I HAVE the honour to report, for the information of the Council, on the work which has been done for the quarter ending 31st December 1882.

The printing of the sea surface temperature charts is progressing. I have received from Mr. Malby four proof sheets, viz., three of the Pacific and one of the Atlantic; these have been examined and corrected and the lines of equal temperature re-drawn.

The remarks to accompany the charts have been under revision; they will probably require further modification.

The temperature of the sea surface for the ocean district adjacent to Cape Guardafui has been examined, and charts have been constructed for the six months, May to October, and also for the months of February and November.

The result of this investigation seems to show that a remarkable difference in temperature exists in the months from May to June, and I purpose to examine these two months more minutely.

I have, &c.

Captain H. Toynbee F.R.A.S., Marine Superintendent. (Signed) C. W. BAILLIE.

Mr. Scott reported that two female assistants had been engaged (Minutes, p. 63) at the following initial salaries:—

Miss Everetta Anderson, 15*s.* per week, to commence January 1.
Miss Maria Harris, 12*s.* 6*d.* per week, to commence January 8.

Reported—That Mr. Walter Butters had been engaged to work in the Marine Room at 1*l.* 15*s.* per week from the 4th instant.

With reference to the "Report on the Meteorology of Kerguelen" (Minutes, p. 64), it was resolved that a honorarium of ten guineas each be given to Messrs. Archibald and Ellis for their work.

Submitted—The following memorandum, which was approved:—

TO THE COUNCIL.

GENTLEMEN.

I BEG to suggest the following slight modifications in the "Report from the Kew Committee on the best means of ensuring accuracy in the numerical values obtained from the Records of the Self-Recording Observatories," (Minutes, 1868, p. 100, Report 1868, App. XII.), as experience has shown that the Central Office may safely be relieved from certain duties in respect of the examination of the records.

(Signed) ROBERT H. SCOTT.

BAROGRAPH.

OLD RULE.	NEW RULE.
P. 102, 2nd para., p. 103 (22*f.*—"Should any portion of the curve be too faint for measurement with the ordinary tabulating instrument, but not too faint for measurement with the ivory scale, it ought not to be measured at the outlying observatory, but at Kew."	*Read.*—"It should be measured at the outlying observatory, and the word 'approximate' attached to the values found." (17*a.*)—"Examine all differences between any two consecutive hourly readings which amount to or exceed ·05 in."

THERMOGRAPH.

OLD RULE.	NEW RULE.
Should any portion of the curves be *deficient from want of light, bad action of wet bulbs, or any other cause,* nothing ought to be done with it at the outlying observatory except to mark in pencil above that portion which appears defective.	Faint curves to be measured at the outlying observatory (as in the case of the barograph), and the word "approximate" attached to the values found. (18*a*.)—Examine all differences between any two consecutive readings which amount to or exceed 5°. Consider all differences of 0°·5 or upwards, between the measurements at the Central Office and the outlying observatory, as errors.

ANEMOGRAPH.

(7.)—The assistant at Kew shall examine each curve in order to see if both pencils work well and freely, and if the paper has been accurately attached to the cylinder, and if the cylinder has not slipped. (8.)—He shall see that the clock has been in good order during the time of the curve. (9.)—That the curve is properly written upon after the pattern adopted. (10.)—That in the writing upon the curve the proper day of the month is placed alongside the day of the week. (11.)—That the times of putting on and taking off as recorded by the pricker do not differ more than five minutes from the chronometer time. (12.)—He shall inspect the direction and velocity curves in connexion with the tabulated results, in order to ascertain that each curve is tabulated under its proper date. (13.)—Check the accuracy of the subtractions made in the tables of the subsidiary direction measurements. (14.)—Examine all cases in which A—B is greater than two points, and if an error is revealed it ought to be corrected at once. (15.)—Check the accuracy of the velocity tabulations, according to the method herein indicated. (16.)—Make 40 re-measurements for each month, both for direction and velocity, as in the case of the other instruments.	Add to the old rules the following note :— These rules are to be understood as not implying a systematic re-tabulation.

Reported—That instructions had been given to the Post Office to lay the private wire between Cliffoney and Mullaghmore (Minutes, 1881, p. 45).

Resolved—That the allowance to Mr. Kerr, the observer at Mullaghmore, be increased to 8*s*. per week from the date of establishment of the telegraphic communication.

Submitted—The following statements of work for December 1882 :—

MARINE ROOM.

January 2, 1883.

Examined 13 new logs.

North Atlantic Weather Charts.

Preparation of data for charting.
Examining proofs of working charts.
Correspondence and work at the Docks in London in connexion with the Weather Returns.

(Signed) CHARLES HARDING.
HENRY TOYNBEE,
Marine Superintendent.

PANTAGRAPH ROOM.

December 30, 1882.

Copper Plates pantagraphed :—5 plates, Nos. 10 to 14, 1878.
Zinc Plates.—Barograms, 7 plates, Nos. 15 to 21, 1878; Thermograms, 6 plates, Nos. 16 to 21, 1878; Vapour tension, 6 plates, Nos. 13 to 18, 1878; Anemograms, 5 plates, Nos. 32 to 36, 1878; Rain curves, 2 plates, Nos. 19 and 20, 1878.

Office

Photographic Curves are prepared to Plate 29, 1878, in the case of the barograms; and to Plate 21 for thermograms; the rain curves have been prepared for pantagraphing as far as Plate 36 1878.

Harmonic Analyser.—The constants for two observatories for 1873 have been worked out; and the results obtained for 1876, by the instrument and by calculation, have been plotted fo publication in the Quarterly Weather Report. The analysis of the temperature curves for 187 is now in hand and about three-fourteenths of the curves have been passed through the instrument.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

January 1, 1883.

The following curves and tabulations have been examined:—October (1882): *Thermograms*, three stations; *Barograms*, two stations; *Anemograms*, four stations.

November (1882): *Thermograms*, two stations; *Barograms*, two stations; *Anemograms*, two stations.

The Christmas holidays, together with the interruptions consequent upon the change of rooms have somewhat retarded the progress of the work.

R. H. Scott, Esq., M.A., F.R.S. (Signed) T. E. ALLEN.

TELEGRAPH BRANCH, during the SIX MONTHS which ended on 31st December 1882.

SIR,

THE work referred to in this report is what has been done in addition to the regular routine work of the room, the latter consisting of—

The preparation and issue of the *Daily Weather Report*, of the *Forecasts and Storm Warnings*, the *Weekly Weather Report*, and the checking of the daily Forecasts.

The *Additional* work done has been as follows:—

1. *Quarterly Weather Report.*
   Part 2, 1876.—Completed and sent to press: letter-press once revised, Charts in proof.
   Parts 3 *and* 4.—Tables for Section III. completed, and the rough drafts of the Wind and Weather Charts, excepting the maps showing the "Movements of the Depressions."
   Part 2, 1879.—Tables for Section III. nearly complete.
2. *Instructions for Meteorological Telegraphy.*—Revised and issued to observers.
3. *Instructions in observing the Upper Clouds.*—Revised and issued to several observers.
4. *Charts showing the Distribution of Mean Temperature of the Air over the British Islands for each Month and for the entire Year.* For 20 years, 1861—80.
   Maps all drawn and sent to Lithographer.
5. *Charts*, similar to above, but showing distribution of *Mean Pressure.*—The observations available having proved insufficient, additional values have now been calculated, partly in the Telegraph Room and partly by Mr. Marriott.
6. *Weekly Weather Report—under revision.*—Considerable time has been spent on this.
7. *Hay Harvest Forecasts*, arranged, issued, and checked (Minutes, December 6),
8. *A Chart showing Distribution of Mean Rainfall over the British Islands during the* 15 *years* 1866 *to* 1880.—New values are being calculated (about 15 stations done) in order to supplement those furnished by Mr. Symons (Minutes, 1881, p. 42).
9. *Tables giving a summary of the Meteorological Observations made at Telegraphic Reporting Stations during each month in the years* 1881 *and* 1882.
   The preparation of these was *commenced* earlier in the year, and most of the values for 1881 and a small part of 1882 were completed. During these six months, however, the whole have been completed, printed, and issued as a supplement to the Daily Weather Report.

It is necessary to point out that during four out of the six months here referred to the members of the staff were taking their summer vacation in rotation, and during such times it is impossible for those left on duty to do much in addition to the ordinary routine work.

There has also been a good deal of time lost on account of sickness.

Mr. Gaster absent from this cause for a fortnight.
Mr. Brodie „ „ two days.
Mr. Francis „ „ two days.
Mr. Rigby „ sickness at home three days.

(Signed) FREDERIC GASTER

To R. H. Scott, Esq.

The following cheques for December were drawn on the 30th of that month:—

Administration:		£ s. d.	£ s. d.
R. H. Scott, salary		- -	66 13 4
J. S. Harding, jun.	Salaries and wages	27 15 6	
T. D. Bell		14 8 10	
R. G. Canham		8 6 8	
			50 11 0
Carried forward			£ 117 4 4

	£	s.	d.	£	s.	d.
Brought forward -	-		-	117	4	4
Administration—*cont.*						
C. W. Jacques, rent - - - -	151	13	6			
„ new agreement and stamps -	5	12	0			
				157	5	6
Pall Mall Coal Company, coals - -	-		-	11	10	0
Pickford & Co., carriage of parcels - -	-		-	1	1	10
Williams & Norgate, books - - -	-		-	5	7	4
J. S. Harding, sen., pension, October 15–December 31 -	-		-	9	1	3
Special Researches:						
C. E. Strachan, Arctic work - - -	-		-	2	8	9
W. Thomas, care of Scilly anemometer -	-		-	1	13	8
H. Williams, care of "Bridled" anemometer -	-		-	2	16	11
Land Meteorology:						
C. Niven, Aberdeen - - - -	-		-	69	4	6
J. L. E. Dreyer, Armagh - - -	-		-	*84	8	3
W. L. Fox, Falmouth - - - -	-		-	72	12	0
R. Grant, Glasgow - - - -	-		-	67	16	0
H. Williams, Holyhead - - -	-		-	3	1	8
G. M. Whipple, Kew - - - -	-		-	100	0	0
C. Clouston, Orkney - - - -	-		-	2	19	3
G. H. Aird, Seaham - - - -	-		-	2	13	10
J. New, Stonyhurst - - - -	-		-	56	2	4
J. E. Cullum, Valencia - - -	45	11	4			
Do. (salary) - - - -	16	13	4			
				62	4	8
J. O'Driscoll, rent at Valencia - - -	-		-	25	0	6
G. T. Watson, Yarmouth - - -	-		-	4	18	0
P. Adie, repairing Oxford anemometer -	-		-	7	14	6
E. E. Cobley, computations - - -	-		-	3	3	0
R. H. Curtis -	22	4	5			
J. A. Curtis -	15	11	1			
T. E. Allen -	15	11	1			
C. H. Thompson -	†12	2	6			
E. G. Aldridge -	†9	15	10			
Discussion, &c. of Observations.				75	4	11
Weather Information and Forecasts:						
J. McCormack, Aberdeen - - -	-		-	‡3	3	0
J. W. Mayes, Ardrossan - - -	-		-	‡4	3	0
Postmaster, Bundoran - - - -	-		-	1	8	0
H. Todd, Cambridge - - - -	-		-	‡7	19	10
Postmaster, Cliffoney - - - -	-		-	1	1	0
H. Mohn, Christiania - - - -	-		-	5	10	0
T. MacGowan, Donaghadee - - -	-		-	‡3	17	0
J. Costello, Dover - - - -	-		-	‡7	1	6
W. Brand, Dunrossness - - -	-		-	‡7	1	4
Postmaster, „ - - - -	-		-	1	6	0
W. Foster, Hawes Junction - - -	-		-	‡7	1	3
J. Tilston, Holyhead - - - -	-		-	‡7	1	0
G. G. Appleton, Hurst Castle - - -	-		-	‡7	1	8
Postmaster, Inverness - - - -	-		-	1	6	0
J. Fisher, Jersey - - - -	-		-	‡7	8	6
Postmaster, Killarney - - - -	-		-	1	1	0
J. Hutchison, Leith - - - -	-		-	‡3	16	0
Postmaster, Lerwick - - - -	-		-	1	6	0
F. Gaster, London - - - -	-		-	‡7	1	0
W. Berridge, Loughboro' - - -	-		-	‡6	8	10
Carried forward -	-			£1,037	14	11

* Including balance due for September quarter.

† Five weeks ending 30th December. ‡ Including a bonus of 3*l.* 3*s.*

Weather Information and Forecasts—*cont.*

	£	s.	d.	£	s.	d.
Brought forward -	-		-	1,037	14	11
K. Kerr, Mullaghmore - - -	-		-	*13	1	3
M. Mackintosh, Nairn - - - -	-		-	0	13	0
W. D. Penny „ - - - -	-		-	*7	7	6
J. W. Irvine, North Shields - - -	-		-	*3	3	0
W. Wickham, Oxford - - - -	-		-	*6	15	6
G. Phillips, Parsonstown - - -	-		-	*6	10	6
J. John, Prawle Point - - - -	-		-	*6	8	0
W. Kennedy, Roche's Point - - -	-		-	*3	3	0
S. Blake, St. Ann's Head - - -	-		-	*7	13	1
W. Thomas, Scilly - - - - -	-		-	*8	18	1
R. W. Scaddan, Scilly - - - -	-		-	0	14	0
J. B. Smith, Spurn - - - - -	-		-	*6	8	4
D. Macdonald, Stornoway - - -	-		-	5	11	6
Postmaster, Valencia - - - -	-		-	0	14	0
J. Sinclair, Wick - - - - -	-		-	*6	8	0
G. T. Watson, Yarmouth - - -	-		-	7	11	10
A. Guy, York - - - - - -	-		-	3	18	0
Postmaster-General, telegrams - - -	-		-	186	3	11
F. Gaster -	33	0	4			
F. J. Brodie -	19	13	0			
G. G. Francis — Preparation, &c. of Weather Reports.	21	9	10			
A. J. Rigby -	15	0	0			
R. Sargeant -	†14	12	9			
				103	15	11
Inspections:						
A. Buchan, salary - - - - -	37	10	0			
W. C. Ley, „ - - - - -	37	10	0			
				75	0	0
Ocean Meteorology:						
Capt. H. Toynbee -	33	6	8			
Nav. Lieut. C.W.Baillie, R.N.	20	16	8			
C. Harding - - — Discussion, &c. of observations and care of instruments.	22	4	5			
R. Strachan - -	27	15	6			
H. Harries - -	†14	12	6			
				118	15	9
P. Adie, repairing "A." instruments - -	8	11	6			
„ „ "B.T." „ - -	7	11	0			
				16	2	6
W. Allingham, collection of synchronous observations - -				9	0	5
Bank of England, Stationery Office account for special printing				26	6	1
Central News, Limited, advertisements respecting synchronous observations - - - - - - -				53	9	5
R. Riviere & Son, presentation labels - - - -				2	17	0
J. Green, care of Bermuda anemometer - - -				4	12	0
Miscellaneous:						
Kew Committee, commissions - - - -				9	2	11
Meteorological Society, commissions - - -				2	0	0
J. S. Harding, jun., petty cash - - - -				50	0	0
Total -				£1,789	19	5

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.	
2nd December - - - - -	29	12	1	
9th „ - - - - -	29	12	1	
16th „ - - - - -	29	12	1	£148 0 5
23rd „ - - - - -	29	12	1	
30th „ - - - - -	29	12	1	

* Including a bonus of 3*l.* 3*s.*

† Five weeks ending 30th December.

116, *Victoria Street, January* 17, 1883.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | LIEUT.-GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 3) were read and confirmed.

Read—The following letter:—

M.O. 150. (Translation.)

DEAR MR. SCOTT, Vienna, January 15, 1883.

HIPP'S barograph has been at work here since 1871, but we use the curves very seldom, only when the other barograph gets out of order. Like all electrical apparatus, it comes often enough to a standstill, and the temperature correction of our instrument is very considerable, which is a great inconvenience, because we must keep a thermograph in the chamber in order to be able to reduce the curves. In a chamber in which the temperature is very constant, at least for the duration of a day, it may be used very well. It records every 10 minutes.

Of the mechanically self-registering barographs, I can cordially recommend that of Höttinger of Zürich. The temperature compensation is sufficient to meet all the changes of temperature which will take place in the course of a day in a chamber which is not heated, but we only use it for interpolation between the regular observations, not as an absolute barometer. In fact, for the latter purpose, no self-registering barometers are suitable unless photographic ones, like those at Kew. Höttinger's barograph only gives an indication every hour, but could easily be arranged so as to record half-hourly. The cost is 18*l.*

Höttinger's new thermograph, which you will find described in the December number of the "Zeitschrift," has hardly been tested enough for me to recommend it, but it is probably one of the best of those registering mechanically. The price is small, hardly 12*l.*

I have, however, no special experience of registering apparatus, because the only ones I know well are what we have in this observatory.

R. H. Scott, Esq. (Signed) J. HANN.

The Chairman reported that on a recent visit to the Bureau Central de Météorologie in Paris he had inspected the barographs of Redier and Richard, and the thermograph of Richard, referred to by Professor Mascart in his letter read at last meeting. He also submitted specimen curves lent by M. Mascart from the two instruments of Richard.

Mr. Galton exhibited a self-recording aneroid, price 6*l.*, sold by T. W. Watson, Pall Mall.

Mr. Scott was instructed to make further inquiries as to the last-named instrument.

Mr. Scott submitted a map of the British Isles showing the extreme points on the Atlantic coasts to which the telegraph wires have been carried.

Mr. Scott submitted the following Report, which had been prepared in accor ance with instructions from the Council:—

REPORT on the ALLEGED DECREASE of WATER in RIVERS and SPRINGS.

IN the year 1873 a Report by Herr Wex, the engineer of the Danube Works at Vienna, was published by the Ingenieur und Architekten Verein, in that city, and was subsequently distributed to scientific bodies abroad by the Vienna Academy.

The subject attracted general attention on the Continent, where, especially in Russia, the clearances of forest on the Volga, for instance, have been very extensive, while the river is said to be changing its character.

Herr Wex's paper reached this Office in 1875, and was brought before the Meteorological Committee (Minutes, 1875, p. 28). In the course of the same year, at my suggestion, the Council of the Meteorological Society appointed a committee to confer with this Office and inquire into the subject for the British Isles (Minutes, 1875, p. 32). This committee (as already reported to you, Minutes, 1880, p. 41) has collected certain data, of which the principal are the following:—

1. Register of Floods on the River Exe, at St. Thomas, Exeter, 1800–1880. By Mr. W. Vicary.

2. Table showing the height to which the water has risen in the Godstone Stone Quarries, Caterham, Surrey, together with the date in each year when the highest maximum water-level was reached. By Mr. Baldwin Latham.

2A. In addition Mr. Latham, whose letter to Mr. Marriott I subjoin, informs me that he has records from wells in the chalk near Marlborough, going back about 50 years.

7, Westminster Chambers, Victoria Street,
Westminster, S.W., December 18, 1882.

DEAR SIR,

As soon as the Thames inquiry is over I will go into the question relative to the diminution of the water supply. I have, as you are aware, been making a large number of gaugings during the last few years, and have collected statistics with regard to underground water for a long period, and from the information thus gained I am clearly of opinion that there is no permanent diminution in the water supply of this country, but there are periods which occur at pretty regular intervals in which there is a dearth of water.

I am, &c.
(Signed) BALDWIN LATHAM.

W. Marriott, Esq.,
30, Great George Street, Westminster, S.W.

3. Note on the Flood and Perennial Water of the Thames. By the Rev. J. C. Clutterbuck.

4. Table of the Daily Volume of Water flowing down the River Thames opposite the Lambeth Waterworks, at Seething Wells, near Thames Ditton, from 1876 to 1879 inclusive. By Mr. Taylor.

The tables for the Thames (Chelsea Waterworks), of which you authorised me to procure a copy (Minutes, 1880, p. 41), consist of records of the Height and Temperature of the River Thames, near Surbiton, from September 1, 1854, to September 30, 1880.

Of records of foreign rivers, besides those given in Ritter von Wex's second paper, Zeitschrift des Oest. Ingen. und Arch. Vereins, 1879, which comprise the—

Rhine,	Moselle,	Tiber,
Danube,	Main,	Seine,
Elbe,	Theiss,	Glommen,
Vistula,	Po,	Mississippi,
Oder,		

I have only been able to find one for the Nile, 1825–75, given in a paper by Mr. B. Baker, C.E., Proceedings Institution of Civil Engineers, Vol. LX., 1880, and another by Prof. Balfour Stewart, F.R.S., Nature, Vol. XXV., p. 268.

(Signed) ROBERT H. SCOTT.

With the view of bringing the checking of the forecasts into systematic connexion with their preparation,—It was resolved—

That it be an instruction to the Telegraph Room that the checking of the forecasts be henceforth kept up daily. The forecasts made by Mr. Gaster to be checked by Mr. Brodie, and the forecasts made by Mr. Brodie to be checked by Mr. Gaster. Discrepancies to be mutually pointed out, and endeavours to be made to account for them. Brief notes of the results of these discussions to be entered in the book, and the initials of the responsible persons to be annexed to all the entries.

The arrears in the checking to be taken up as occasion may present itself, but on no account to interfere with the daily checking.

The Chairman was requested to draw up with the Secretary a draft letter to the directors of the observatories, the suppression of which is in contemplation (Minutes, p. 9):—

Read—A memorandum from Captain Toynbee reporting that since the last meeting four logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Lieut. Commanding R. F. Hoskyn, Lieut. R. H. Baker.	H.M.S. "Flying Fish."	June 1—Sept. 30, 1882.	Surveying in Japanese waters.	1882, p. 75.
Capt. J. Swan -	"City of Madrid"	Feb. 19—Dec. 18, 1882.	London, Adelaide, San Francisco, and home.	1881, p. 108.
Staff Commander T. H. Tizard.	H.M.S. "Triton"	May 17—Oct. 31, 1882.	Surveying coast of United Kingdom.	1881, p. 134.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Reported—That Miss Alice Whatley had been appointed an assistant, at the salary of 12*s.* 6*d.* per week, commencing January 22nd.

Resolved—That the following be the maximum salaries allowed to the female assistants:—

Miss Anderson, the principal assistant, 30*s.* per week.
The other assistants, 20*s.* per week.

Mr. Scott was authorised to raise the salaries according to proficiency until the maximum is reached in each case.

Mr. Scott reported that it was proposed to have an exhibition of storm-warning apparatus at the coming International Fisheries Exhibition. He was authorised to expend a sum not exceeding 20*l.* for this purpose.

Submitted—A draft of the Barometer Manual, prepared in compliance with the request of the Board of Trade (Minutes, p. 60).

Submitted—The following report on the forecasts for July and August 1882:—

The letters used have the following signification:—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

JULY.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	38	58	48	90
"	b	42	42	42	
"	c	12	—	6	
"	d	8	—	4	
Scotland, E.	a	39	46	43	79
"	b	38	35	36	
"	c	19	12	16	
"	d	4	7	5	
England, N.E.	a	58	42	50	83
"	b	27	39	33	
"	c	15	15	15	
"	d	—	4	2	
England, E.	a	62	38	50	77
"	b	19	35	27	
"	c	11	23	17	
"	d	8	4	6	
Midland Cos.	a	46	35	41	85
"	b	42	46	44	
"	c	8	19	13	
"	d	4	—	2	
England, S.	a	77	54	66	87
"	b	15	27	21	
"	c	4	12	8	
"	d	4	7	5	
Scotland, W.	a	46	58	52	91
"	b	46	31	39	
"	c	4	11	7	
"	d	4	—	2	
England, N.W.	a	58	54	56	79
"	b	23	23	23	
"	c	12	19	16	
"	d	7	4	5	
England, S.W.	a	54	58	56	85
"	b	31	27	29	
"	c	8	11	10	
"	d	7	4	5	
Ireland, N.	a	42	54	48	90
"	b	46	38	42	
"	c	8	8	8	
"	d	4	—	2	
Ireland, S.	a	50	54	52	81
"	b	27	31	29	
"	c	15	15	15	
"	d	8	—	4	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	49	42	46	83
"	b	32	42	37	
"	c	13	16	14	
"	d	6	—	3	
Scotland, E.	a	58	39	49	91
"	b	36	49	42	
"	c	3	6	5	
"	d	3	6	4	
England, N.E.	a	65	42	54	86
"	b	26	39	32	
"	c	9	13	11	
"	d	—	6	3	
England, E.	a	65	61	63	86
"	b	16	29	23	
"	c	13	3	8	
"	d	6	7	6	
Midland Cos.	a	68	52	60	83
"	b	9	26	23	
"	c	10	22	16	
"	d	3	—	1	
England, S.	a	81	58	70	89
"	b	10	29	19	
"	c	6	3	5	
"	d	3	10	6	
Scotland, W.	a	45	32	39	81
"	b	39	45	42	
"	c	10	16	13	
"	d	6	7	6	
England, N.W.	a	65	49	57	89
"	b	19	45	32	
"	c	10	3	7	
"	d	6	3	4	
England, S.W.	a	58	55	57	83
"	b	20	32	26	
"	c	16	10	13	
"	d	6	3	4	
Ireland, N.	a	52	39	46	83
"	b	26	49	37	
"	c	16	6	11	
"	d	6	6	6	
Ireland, S.	a	45	29	37	71
"	b	23	45	34	
"	c	29	20	25	
"	d	3	6	4	

SUMMARY.

British Isles	a	52	50	51	84
"	b	32	34	33	
"	c	11	13	12	
"	d	5	3	4	
British Isles	a	59	45	52	84
"	b	24	11	32	
"	c	12	5	11	
"	d	5		5	

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

AUGUST.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	59	63	61	87
„	b	30	22	26	
„	c	4	8	6	
„	d	7	7	7	
Scotland, E.	a	63	56	60	87
„	b	22	33	27	
„	c	8	11	10	
„	d	7	—	3	
England, N.E.	a	56	52	54	82
„	b	29	26	28	
„	c	11	18	14	
„	d	4	4	4	
England, E.	a	59	70	65	91
„	b	26	26	26	
„	c	11	—	5	
„	d	4	4	4	
Midland Cos.	a	52	44	48	91
„	b	37	48	43	
„	c	7	4	5	
„	d	4	4	4	
England, S.	a	63	81	72	95
„	b	30	15	23	
„	c	7	—	3	
„	d	—	4	2	
Scotland, W.	a	48	37	43	83
„	b	33	48	40	
„	c	11	15	13	
„	d	8	—	4	
England, N.W.	a	55	44	50	81
„	b	26	37	31	
„	c	15	15	15	
„	d	4	4	4	
England, S.W.	a	37	41	39	87
„	b	48	48	48	
„	c	11	11	11	
„	d	4	—	2	
Ireland, N.	a	41	48	45	86
„	b	37	45	41	
„	c	11	—	5	
„	d	11	7	9	
Ireland, S.	a	30	41	36	74
„	b	33	44	38	
„	c	19	11	15	
„	d	18	4	11	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	55	39	47	83
„	b	32	39	36	
„	c	7	16	11	
„	d	6	6	6	
Scotland, E.	a	55	39	47	82
„	b	29	42	35	
„	c	10	10	10	
„	d	6	9	8	
England, N.E.	a	61	49	55	87
„	b	29	35	32	
„	c	10	10	10	
„	d	—	6	3	
England, E.	a	58	42	50	91
„	b	29	52	41	
„	c	7	3	5	
„	d	6	3	4	
Midland Cos.	a	58	52	55	87
„	b	29	35	32	
„	c	7	7	7	
„	d	6	6	6	
England, S.	a	65	58	62	94
„	b	29	36	32	
„	c	6	6	6	
„	d	—	—	—	
Scotland, W.	a	39	39	39	78
„	b	35	42	39	
„	c	10	10	10	
„	d	16	9	12	
England, N.W.	a	52	45	49	78
„	b	32	26	29	
„	c	13	19	16	
„	d	3	10	6	
England, S.W.	a	45	42	44	81
„	b	39	35	37	
„	c	13	10	11	
„	d	3	13	8	
Ireland, N.	a	35	26	31	76
„	b	42	48	45	
„	c	10	10	10	
„	d	13	16	14	
Ireland, S.	a	19	32	26	66
„	b	39	42	40	
„	c	32	16	24	
„	d	10	10	10	

SUMMARY.

British Isles	a	51	53	52	86
„	b	32	36	34	
„	c	10	8	9	
„	d	7	3	5	
British Isles	a	49	42	46	82
„	d	33	39	36	
„	c	12	11	11	
„	d	6	8	7	

116, *Victoria Street, January* 31, 1883.

PRESENT:

PROFESSOR H. J. S. SMITH IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | LIEUT.-GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of last meeting (January 17) were read and confirmed.

Submitted—The following draft of letter to the observatories of Armagh, Falmouth, Glasgow, and Stonyhurst:—

SIR,

I AM instructed by the Meteorological Council to inform you that they consider there is no longer adequate reason for the maintenance out of the funds placed at their disposal by the Government of so many as seven self-recording meteorological observatories of the first class, and that they propose to retain only those of Kew, Valencia, and Aberdeen.

The Council therefore contemplate the discontinuance of the annual grant hitherto made to your observatory after the 31st December next.

If, however, the authorities interested in your observatory should have the means of continuing the existing system of observations, and desire to do so, the Council would be willing to leave at your disposal, for this purpose, the outfit of self-recording instruments at present under your care.

Read the following letter (Minutes, 1881, p. 98):—

M.O. 257. Meteorological Society, 30, Great George Street,
DEAR SIR, Westminster, S.W., January 31, 1883.

I HAVE much pleasure in forwarding herewith the monthly and yearly means of the sea and air temperatures observed at the lightships and coastguard stations round the British Isles for the two years July 1880 to June 1882, and also the averages for the three years July 1879 to June 1882.

Yours, &c.
R. H. Scott, Esq., F.R.S. (Signed) WILLIAM MARRIOTT.

The Secretary was instructed to have the results laid down on monthly charts for the Atlas (see Report for 1880, p. 23).

Submitted—The preface to the Rainfall Tables of the British Isles (O. 47), which was approved. The Secretary was instructed to insert in the work the rainfall map which will appear also in the Meteorological Atlas of the British Isles (Minutes, pp. 41 and 63).

The draft of the Barometer Manual was again considered.

Submitted the following:—

M.O. 251.

REPORT of the INSPECTION of the ENGLISH STATIONS.

TELEGRAPHIC REPORTING STATIONS.

Prawle Point (visited July 4th).—The instruments were all in the best possible order, and the observations continue to be carefully conducted. Turf has been, at last, laid down around the Stevenson's screen. The observer (Mr. J. Johns), was absent, being on duty with the Channel Fleet, at the time of my visit, and the chief boatman was taking the observations. I found that he set the vernier too low, the error so produced being about −·006 in., but after the instructions given him, I think the mistake will not be repeated. I had endeavoured to make arrangements to visit this station in a gale, but did not arrive at the right time. There is no doubt that winds of forces above 7 are more rarely recorded here than one would, from the Scilly, Hurst, and Jersey reports, be led to anticipate. In my inspection notes for 1881 I expressed an opinion that this was due to a too low estimate on the part of the observer. During the past winter and spring I had an opportunity of continuously testing the reports from Prawle by observations taken on the coast about 22 miles to the west of this station. I now think that it is the Scilly, Hurst, and Jersey reports which are rather at fault, the observer at the first of those stations having considerably, and those at the two last slightly, over-estimated the forces of high winds. The directions of the wind at this station (in marked contrast to those at Hurst, where the south-westerly winds are greatly deflected) are thoroughly representative of those over the neighbouring parts of the Channel.

Loughborough (visited August 18th).—The instruments were all found to be in good order, and the observer carries on the work with the greatest carefulness. As has been previously reported, when the station was inspected as one of the second order, the position of the outdoor instruments though not quite unexceptionable is as good as can ordinarily be obtained in a private garden in a town. The new rain-gauge is close to the old five-inch gauge, and has a fair exposure. The observer's estimate of the force and direction of the wind, which I have checked for a long period, appears to me to be accurate, though gales are reported with more frequency than one would expect. The observer's clerk is able to read the instruments correctly, should occasion require; but Mr. Berridge himself is never absent from home.

Barrow-in-Furness (inspected August 26th).—The observations seem to be carefully made and reported, and the instruments were in fairly good order. In my last year's report I mentioned that the reporting barometer read apparently too high. The discrepancy which I then found between its reading and those of the check barometer, a good Fortin (as well as those of my own standard), has been further established by 13 comparisons taken in June last between the reporting barometer and the Fortin, the mean result of the comparisons being that the reporting barometer reads ·048 in. above the Fortin. From my own comparison made this year similar results appear, as shown in Table I. The observer, however, does not set the ivory point of the Fortin with facility, the instrument not being in a very convenient light; so that it will be better that the marine barometer, No. 312, should either continue to be used, or be exchanged for another instrument of the same pattern, or for one of the less contracted tubes. I continue to consider that the observer estimates the wind correctly, but that it is rarely possible for him to form a precise judgment of the amount of sea disturbance.

From observation and inquiry I conclude that the remarkable smallness of the angle of deviation of the winds as observed at this station is characteristic of this part of the English coast, and is not due to influences specially affecting the spot at which the observations are taken.

York (inspected August 30th).—The observations show a slight improvement as the gardener of the museum grounds reads the instruments more accurately than formerly. The vane had been blown down and had not been again erected. This renders the task of estimating the direction of the wind a rather difficult one, the gardens being in a somewhat sheltered locality where there is little opportunity of observing the motion of smoke from chimneys.

North Shields (inspected August 29th).—The barometers were found in good order and agreed perfectly with my standard. The Stevenson's screen much required repainting both on the inside and the outside. This has since been done in accordance with directions. The wet-bulb thermometer was found to be not sufficiently clean. (The muslin at this place requires very frequent changing, the atmosphere being extremely charged with carbon.) The thermometers required reblackening and varnishing, which I did. The old rain-gauge has been well repaired and may last for some years. It has been furnished, in accordance with my instructions, with strong metal wings resting on the ground for the observer to stand upon when lifting the funnel; these keep the instrument level. The observer, Mr. Irvine, seems to be attentive to his work, and the reports are, as a rule, good.

Scilly, St. Mary's (inspected by the Secretary on September 14th).—The two barometers now at the station were found to substantially agree in their readings. The wet-bulb thermometer again read somewhat high. The metal box of the anemometer being small, the pendulum occasionally strikes the side when the pillar oscillates in a gale. Directions were given for remedying this defect. The wind forces reported continuing to be high as compared with the anemograms, the observer was directed to report them about one figure lower than his estimates derived from observing the sails of ships, &c. A spare thermometer was substituted for the wet-bulb previously in use.

London, Brixton (visited October 2nd).—I found everything in admirable order, as usual, at this station.

Jersey, Noirmont (October 4th and 5th).—I took to this station two new barometers having the less contracted tubes. Although these instruments (which were lashed together) were very carefully transported with the cistern ends uppermost thoughout the journey, one of them on suspension at the station was found to contain a very large quantity of air, which, on the tube being taken out, and recourse being had to such measures as were available, I failed to expel. This instrument I accordingly brought back to the Meteorological Office, together with the old check barometer previously suspended at the station. The other new barometer, which was in perfect order, I left for use at the station, leaving the instrument, whose readings had been hitherto reported, in its place as a spare barometer. The outdoor instruments in the new site mentioned in last year's report have a perfect exposure, and they are well attended to. The thermometer screen is over short turf. The rain-gauge is fixed in a very firm solid block. Finding the dry-bulb thermometer, after numerous comparisons in water, at several temperatures, to read too high, I exchanged it for another instrument, the readings of which are correct. The observer continued to be very painstaking and accurate.

Dover (inspected October 9th).—The outdoor instruments were not in a very satisfactory state, the wet-bulb being foul, and the rain-gauge having lost its supports and being much inclined. The observer set the verniers too low, and his readings were not quite correct, but he was suffering at the time of my visit from ophthalmia. The position of all the instruments at the station is eminently objectionable.

STATIONS of the SECOND ORDER, &c.

Plymouth (inspected June 30th).—The observer, Dr. Merrifield, was absent at the date of my visit. I found his assistant to take the observations carefully. No improvement could be suggested as to the position of the instruments, with the exception of the sunshine recorder, from which the sun's rays were intercepted in the summer time by a stack of chimneys. This will be now remedied by raising the instrument to the level of the summit of one of the chimneys of the observer's house. The observations at this station are recorded with much care.

Arlington Court (inspected July 5th).—The altitude is 613 feet above mean sea level. The country around is extremely broken and hilly and clothed with large timber. Extraordinarily heavy falls of rain are occasionally reported from this station. After a study of the climatic aspects of the place, examination of the rainfall entries, and inquiries made both of the observer and others, I am convinced that these reports are perfectly reliable. The position of the instruments is admirable, and therefore incomparably better than that of those at Barnstable, and this circumstance, together with the assiduity of the observer, more than compensate for the fact that the climate of Arlington is, in respect of cloudiness and moisture, somewhat exceptional. The thermometer screen was slightly too high, and did not face in the right direction. I gave directions that this should be altered. The muslin and thread for the wet-bulb were almost quite clean, although they had been unchanged for a year-and-a-half, owing to the immunity of the atmosphere here from smoke. Instructions were, however, given that they should be changed every few months. The rain-gauges are in a meadow at some distance from the old gauge. They collect rather more water than the latter, which was to some extent sheltered by trees on the south-west.

Totnes.—The observer was in the act of leaving for the seaside at the date of my visit (July 3rd), and I was consequently unable to inspect the instruments.

Leicester (inspected August 16th).—The sub-curator of the museum, Mr. Smith, is in charge of the observations. He did not, at the time of my visit, read the instruments with perfect accuracy, and (as was the case with the previous observer) he adjusted the fiducial point wrongly, the result being an error of ·009. I gave instructions and arranged a shade, which may enable the adjustment to be more easily made, the instrument being in a rather inconvenient light. The wet bulb was not in a very clean condition, and the wick employed was of a wrong texture. The necessary directions were given. A fortnight before my visit, the grass thermometer, a Casella forked spirit minimum, had been broken, and a new instrument of the same pattern had been substituted. The alcohol in this instrument I found to be divided, the error arising from this cause amounting to several degrees. I reunited the spirit, and gave the usual directions that the chamber should be frequently examined.

Durham (inspected August 28th).—The outdoor instruments were found to be in good order, except that the grass minimum contained a considerable quantity of spirit in the chamber. The evaporation had, however, very recently occurred, as the observer examines the instrument regularly. The readings of the barometer at this station when corrected for temperature again showed a rather considerable error. On removing the attached thermometer, I found that this instrument, which had no scale on the glass, had been pegged into its brass case with pieces of cork; these latter had become loose, so that the tube had shifted its position, the case being much too large for it. An error arising from this cause may have extended over many years. I rectified this so far as was in my power, so that the thermometer reads correctly, according to its brass scale, in air. The trees on the west of the observatory having been well polled, the sunshine recorder has now a complete exposure.

Stonyhurst Observatory (inspected August 25th).—The barograph and thermograph were in good order. The slight penumbra noticed in the wet-bulb trace is due, as I think, to a defect in the glass of the thermometer. It is most noticeable in the photographic trace at low temperatures, but even at the high temperature at which I examined the instruments, the specks on the sheet had a red tint as compared with those from the dry bulb. The thermometers for eye observations when compared in water agreed closely with my standard. In the absence of Father Perry I could not obtain the corrections of the standard barometer, which read considerably lower than the inspector's standard. The Beckley self-registering rain-gauge possesses the same fault as that at Falmouth, but otherwise works well.

York (inspected August 30th).—The position of the outdoor instruments (with the exception of the sunshine recorder, the exposure of which is very good) is, as I have before complained, rather unsatisfactory, but I see no hope of effecting any improvement. The rain-gauges are now advantageously fixed in a strong block of wood; their rims are thus two feet above the ground; except that this would be a still further deviation from the regulation, they might with advantage be still higher, if shelter from the trees is to be avoided.

Jersey, St. Aubins (visited October 5th).—No change had been made at this station since the inspection in the previous year. The instruments as usual were found to be in perfect order, and the work to be carried on with most admirable precision and care.

Southampton, Northam (October 7th).—Since my last visit a total change of position had been made of all the instruments at this station; this change being of an advantageous character as regards the sunshine recorder and the barometer, and disadvantageous with respect to the other instruments. The thermometer screen was, in the first place, shifted from the vegetable garden to the site which I had recommended, as being further from the garden wall; that site being a lawn on the north-west of the buildings. Shortly afterwards this site had to be occupied by new computing rooms, and at the same time the vegetable garden was converted into a lawn-tennis

ground. The instruments were then moved into their present position, which is a narrow strip of lawn on the east of the buildings. Here the screen is 15 feet only from the railings which divide the lawn from the street; there is, however, a laurel hedge four feet in height between the screen and these railings. More serious than the neighbourhood of the road, is the nearness of the buildings on the west and south-west, which subtend about 50° at the rim of the rain-gauge, and 40° at the level of the thermometer bulbs. I failed to obtain permission from the director, General A. C. Cooke, to remove the instruments to the centre of the old tennis lawn near to the place in which the observatory used to stand, which would be a much more satisfactory position for them. The solar radiation thermometer at present occupies a position on the north-east of the new lawn. Here it is slightly sheltered by the trees in the morning. The sunshine recorder occupying a position on the roof of the south range of buildings has now a perfect exposure. The barometer, a very old but accurate instrument, is now in a glass case in one of the porches, and in a far more convenient light than in its former position at the observatory. The observations continue to be admirably conducted.

Beccles, Geldeston (inspected October 11th).—The work at this station is conducted in a perfect manner, the observer devoting to it a great deal of time and attention. The instruments were in excellent order. The old minimum thermometer to which I had previously taken exception because its scale was of insufficient extent, and because the chamber passed so far into the frame that it was never possible to see whether spirit had been condensed in it or not, had been recently discarded, and a better instrument substituted. The Redier at this station works most admirably, requiring a very small amount of attention, and registering with perfect precision the smallest oscillations of pressure in squalls, thunderstorms, &c.

The inspection of the English stations this year has been somewhat meagre. I was detained on the south coast by ill-health until after midsummer, and in the autumn I have for the same reason been able to travel but little, though slowly recovering strength. I have every hope of being able to perform the work of inspection thoroughly in 1883.

I regret to report a mortality among the instruments under my charge. Besides one thermometer, two barometers have had their tubes broken, one by a jolt received in a railway carriage, and one by another accident, totally unavoidable on my part, the details of which have already been communicated to the Meteorological Office. Precaution, while rendering such accidents rare, cannot absolutely provide against their occurrence.

Table I. refers to Telegraphic Reporting Stations, and shows the difference between the readings of the barometers and thermometers at those stations, and the readings of the inspector's standards, the former being uncorrected, and the latter corrected for index errors. The asterisk against the reading of any instrument indicates that this instrument, in use at the station at the date of inspection, has been changed for another, which is now employed.

Table II. shows the results of the comparisons of thermometers at stations furnishing monthly and weekly reports.

I.

Station.	Barometers.			Thermometers.				
	Height of Mercury.	Reporting.	Check.	Temp. of Water.	Dry Bulb.	Wet Bulb.	Max.	Min.
Barrow - - -	29·59	+·034	−·011	61°	+0°·1	+0°·2	−0°·1	−0°·2
Dover - - -	30·22	−·009	−·007	57	−0·1	−0·1	0·0	+0·3
Jersey - - -	30·31	+·001*	−·001*	55	+0·6*	+0·4	+0·1	0·0
London - - -	30·08	−·004	—	58	+0·2	+0·1	0·0	−0·1
Loughborough - -	29·88	−·021	—	59	+0·3	+0·4	−0·2	−0·1
Prawle - - -	29·48	+·002	+·001	60	+0·1	+0·2	+0·1	−0·4
Scilly - - -	29·68	—	—	55	+0·2	+0·7*	+0·1	−0·6
Shields - - -	29·34	+·001	+·007	58	0·0	0·0	−0·1	−0·6
York - - -	29·90	—	—	56	0·0	0·0	+0·6	−0·4

II.

—	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Solar Radiation.	Grass Minimum.
Arlington - - - -	−0°·2	0°·0	0°·0	−0°·5	° —	° —
Beccles - - - -	0·0	+0·1	0·0	0·0	0·0	+0·1
Durham - - - -	0·0	0·0	0·0	−0·5	−0·4	−0·3
Leicester - - - -	+0·1	+0·2	−0·3	−0·5	+1·6	−0·5
Plymouth - - - -	+0·1	+0·2	+0·4	−0·4	—	—
St. Aubins - - -	−0·2	−0·1	+0·1	−0 3	—	−0·1
Southampton - - -	+0·3	+0·3	+0·7	−0·1	—	−0·2
Stonyhurst - - -	−0·1	−0·2	0·0	−0·2	—	—
York - - - -	0·0	0·0	+0·1	0·0	—	—

(Signed) W. Clement Ley.

Report on the Inspection of the Scottish Stations during 1882.

The barometers at the stations at Inverness, Nairn, Laudale, Ardrossan, Leith, and Glasgow were compared with inspector's standard barometer No. 588, these being the stations inspected after my arrival at Nairn. I did not think it necessary, after the complete inspection of 1881, to take the mercurial barometer with me to the more distant stations. Aneroid No. 11 was used, as heretofore, throughout the inspection with the same result, that this aneroid is not a satisfactory instrument for any tolerably accurate comparison of barometers during an inspection of stations. It is, however, of some use in such cases as Aberdeen, Wick, Ardrossan, and Leith, where the reporting and check barometers are kept in houses at some distance from each other.

The results of the comparison are given in Table I., which show that the barometers continue to be in good order. During the year the barometers at Stornoway were removed from Nicolson's Institution to the house of the new observer, whither they have been conveyed in safety, and have been placed in a good position. The check barometer for Ardrossan has also been removed to a new position in Saltcoats, and this has been done satisfactorily.

A column is added to Table I., showing the differences between the observer's reading and the inspector's. The results show a most satisfactory approximation to absolute uniformity in the reading of this instrument among the observers, and it will be seen that almost every error shows a reading slightly too low.

The making of additional observations when the barometer is markedly rising or falling is slowly but steadily on the increase.

I have now had opportunities of seeing all the assistant observers read the various instruments, and have to report that their readings were in every case at least fairly good, and that in all cases the telegraphic message was made up in my presence correctly and without waste of time.

Thermometers.

Table II. gives the results of the comparisons made at each station of their thermometers with inspector's standard No. 2420, the readings of which have been corrected for index errors. The readings of the station thermometers have not been corrected. In every instance the comparison was made as described in last report (Report for 1881, p. 60). The results show no greater difference as regards particular thermometers than one-tenth of a degree between the comparisons made during 1881 and 1882.

The minimum thermometer at Nairn with an error of $+1°{\cdot}0$, and the maximum thermometers at Leith with an error of $+1°{\cdot}6$, have been for some years in use at these stations. I believe these errors are correctly and continuously allowed for in making the observations; but it might be considered whether new instruments might not be sent to replace these, so as to obviate the possible occurrence of errors of observation with these thermometers, especially as regards new assistant observers.

Hygrometers.

The cloth of the wet-bulb at Ardrossan was somewhat soiled, but directions were given that it be more frequently changed in future. At Leith, the cloth of the wet-bulb was not sufficiently trimmed. At the other stations this instrument was found in good order. In future, the observer at Inverness is to read his hygrometers to tenths of a degree.

Box for Thermometers.

Since the former inspection the thermometers had been raised as indicated in previous report at Nairn and Laudale.

The boxes at Aberdeen and Laudale were painted immediately after the inspection of 1881; and the box at Wick was being painted at the time of this year's inspection. The box at Inverness and stand were ordered to be painted, and the ground turfed round for some little distance. As the lower part of the framework on which the box stands at Leith was found to be in a rotting state orders were given to have it properly repaired and firmly fixed.

Rain-Gauges.

A new rain-gauge had been got for Dunrossness, which is placed in the same spot as the old one, and is well and firmly fixed. The rain-gauge at Wick was again found to be deformed, as if by weathering, and was again made circular.

The gauge at Inverness was half an inch off the horizontal and only 9 inches above ground. Directions were given to raise it 12 inches, and that its horizontality be secured. The gauge at Laudale had been brought to the height of 12 inches immediately after the inspection of 1881. All the rain-gauges of the telegraph reporting stations are now placed at the uniform height of 12 inches above the ground.

Anemometers.

At Sandwick this instrument appears from the examination I made to be attended to with due punctuality. The anemometer has this peculiarity, viz., to mark the beginning of the curve at 10.15 a.m., the point must be put down at 10.30 a.m. The change is supposed to have been made at the last repairing of the instrument. It is perhaps better to treat this as an instrumental error than attempt any alteration on the instrument, which is in good working order, and has needed no repairs during the past year.

Owing to the serious and protracted illness of Dr. Clouston, the work of observing has devolved wholly on his servant, Margaret Wishart. She had been carefully trained by Dr. Clouston, and her quiet demeanour, intelligence, and neat-handedness in manipulating the various instruments render her an excellent observer.

Sunshine Recorder.

At Sandwick this instrument is placed near the anemometer in summer, when it has the sun all day. In this position in winter, a part of the manse would throw a shadow on it for a short time; at this time of the year, therefore, it is removed to the south of the manse where it has the sun all day. Since, however, it would be shaded in this position in summer by some low trees in the afternoon, it is then taken to the position near the anemometer.

(Signed) Alexander Buchan,
Inspector of Scottish Stations.

Table I.—Comparison of Barometers, 1882.

Telegraph Reporting Stations.	Inspector's Barometer, No. 588.	Attached Thermometer.	Aneroid, No. 11.	Reporting Barometer.	Attached Thermometer.	Check Barometer.	Attached Thermometer.	Obs. Errors.	Remarks.
	corrected.			uncorrected.		uncorrected.			
Aberdeen	—	—	29·350	29·370	65·0	—	—	—	Assistant's error −·001
Do.	—	—	29·140	—	—	29·146	61·2	·000	
Wick	—	—	29·520	29·528	58·8	—	—	—	Do. −·002
Do.	—	—	29·485	—	—	29·472	59·5	−·002	
Dunrossness	—	—	29·485	29·472	57·5	29·472	57·5	·000	
Sandwick	—	—	29·560	29·580	65·3	—	—	·000	
Stornoway	—	—	30·060	30·044	55·1	30·043	55·5	·000	
Inverness	30·106	54·5	30·160	30·104	54·7	—	—	·000	
Nairn	29·795	54·5	29·820	29·789	55·2	29·793	54·5	−·001	Do. −·001
Laudale	29·695	58·2	29·705	—	—	29·694	59·9	—	
Do.	—	—	29·715	29·760	55·9	—	—	·000	
Ardrossan	29·640	56·2	29·640	29·634	57·3	—	—	·000	Do. −·002
Do.	—	—	29·600	—	—	29·598	56·7	—	
Leith	29·781	63·0	29·780	29·779	63·8	—	—	+·001	Do. −·001
Do.	—	—	29·730	—	—	29·721	59·4	—	

	—		Self.		—	
Aberdeen:					Boswell.	
Observer's Standard, No. 1,149			29·300	63·4	29·300	63·4
Aneroid, No. 11			29·280	—	—	—
Glasgow:					Maclean.	
Inspector's Standard, No. 588 (corrected)			29·109	54·1	—	—
Observer's Standard, No. 1,722 (corrected)			29·109	54·2	29·109	54·2
Aneroid, No. 11			29·115	—	—	—
Old Observer's Standard (uncorrected)			29·095	54·8	29·095	54·8

Table II.—Comparison of Thermometers with Errors, 1882.

Stations.	Inspector's Standard No. 2420, corrected.	Dry Bulb.	Wet Bulb.	Spare T.	Max.	Min.	Time in Water in Minutes.	Change of Temp.	Notes.
	°	°	°	°	°	°		°	
Aberdeen	58·8	+0·4	+0·6	+0·6	+0·5	+0·1	190	0·0	
Wick	58·7	+0·4	+0·5	—	+0·1	+0·2	60	+0·1	
Dunrossness	56·2	+0·4	+0·4	+0·3	+0·5	−0·4	180	+0·0	
Sandwick	56·4	+0·4	0·0	—	+0·6	−0·5	190	+0·3	Max. B.B. +0·1, Min. B.B. +0·2.
Stornoway	54·4	+0·7	+0·6	+0·6	−0·3	−0·4	80	+0·1	
Inverness	52·6	0·0	+0·1	—	+0·1	+0·1	100	+0·3	
Nairn	56·8	+0·2	+0·8	+0·7	+0·1	+1·0	150	+0·2	
Laudale	54·5	+0·2	+0·1	—	+0·2	0·0	110	+0·2	
Ardrossan	53·6	+0·4	+0·4	—	0·0	−0·3	200	−0·1	
Leith	56·5	+0·3	+0·5	—	+1·6	−0·2	85	+0·3	
Observatories.				Max. T.		Min. T.			
Aberdeen	61·3	0·0	+0·6	+0·5	—	−0·1	70	0·0	
				No.10579	No. 10				
Glasgow	54·1	+0·3	+0·1	+0·1	+0·2	0·0	170	0·0	

Submitted—The Forecast Book, with forecasts checked up to the 29th instant, as directed at last meeting.

Submitted—The following report on the forecasts for the month of September 1882 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentages of Success a + b.
Scotland, N.	a	38	46	42	75
,,	b	31	35	33	
,,	c	27	12	20	
,,	d	4	7	5	
Scotland, E.	a	46	38	42	77
,,	b	35	35	35	
,,	c	8	15	12	
,,	d	11	12	11	
England, N.E.	a	54	42	48	79
,,	b	23	39	31	
,,	c	23	15	19	
,,	d	0	4	2	
England, E.	a	62	46	54	89
,,	b	27	42	35	
,,	c	11	4	7	
,,	d	0	8	4	
Midland Cos.	a	42	58	50	77
,,	b	35	19	27	
,,	c	19	15	17	
,,	d	4	8	6	
England, S.	a	54	69	62	83
,,	b	23	19	21	
,,	c	19	4	11	
,,	d	4	8	6	
Scotland, W.	a	19	35	27	69
,,	b	42	42	42	
,,	c	39	8	24	
,,	d	0	15	7	
England, N.W.	a	35	50	43	75
,,	b	38	27	32	
,,	c	27	15	21	
,,	d	0	8	4	
England, S.W.	a	58	50	54	85
,,	b	23	38	31	
,,	c	12	12	12	
,,	d	7	0	3	
Ireland, N.	a	19	35	27	58
,,	b	23	38	31	
,,	c	31	19	25	
,,	d	27	8	17	
Ireland, S.	a	35	23	29	60
,,	b	23	39	31	
,,	c	15	15	15	
,,	d	27	23	25	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentages of Success a + b.
Scotland, N.	a	24	33	29	72
,,	b	50	37	43	
,,	c	13	17	15	
,,	d	13	13	13	
Scotland, E.	a	37	40	39	77
,,	b	40	37	38	
,,	c	6	17	12	
,,	d	17	6	11	
England, N.E.	a	44	43	44	75
,,	b	30	33	31	
,,	c	13	17	15	
,,	d	13	7	10	
England, E.	a	50	47	49	84
,,	b	37	33	35	
,,	c	10	7	8	
,,	d	3	13	8	
Midland Cos.	a	44	40	42	75
,,	b	33	33	33	
,,	c	17	17	17	
,,	d	6	10	8	
England, S.	a	50	43	47	75
,,	b	27	30	28	
,,	c	20	10	15	
,,	d	3	17	10	
Scotland, W.	a	23	30	27	72
,,	b	37	53	45	
,,	c	23	7	15	
,,	d	17	10	13	
England, N.W.	a	40	53	47	68
,,	b	20	23	21	
,,	c	30	7	19	
,,	d	10	17	13	
England, S.W.	a	57	57	57	77
,,	b	13	27	20	
,,	c	20	6	13	
,,	d	10	10	10	
Ireland, N.	a	24	30	27	64
,,	b	30	44	37	
,,	c	23	13	18	
,,	d	23	13	18	
Ireland, S.	a	40	23	31	66
,,	b	20	50	35	
,,	c	17	7	12	
,,	d	23	20	21	

Summary.

British Isles	a	42	45	44	75
,,	b	29	34	31	
,,	c	21	12	17	
,,	d	8	9	8	
British Isles	a	39	40	40	73
,,	b	31	36	33	
,,	c	17	11	14	
,,	d	13	12	12	

Reported that Miss M. A. E. Milton had been appointed an assistant, at 12*s.* 6*d.* per week, and that Mr. Butters had resigned from the 27th instant.

Submitted—Copies of the two papers by Dr. Linsser referred to by Professor De Candolle (Minutes, p. 31).

Submitted—The following statement of accounts for the nine months ending 31st December 1882:—

Income.	£	s.	d.
Balance from year 1881–82	1,102	11	8
Proportion of vote for six months	1,1475	0	0
Repayment of expenses charged under—			
(1.) Incidental expenses	11	8	2
(2.) Special researches	10	8	2
(3.) Observatories and stations	7	0	6
Supply of Weather Information:			
D.W. Charts and Forecasts (£ 196 17 4)			
6 p.m. Charts (20 1 0)			
Information for Press Agencies, &c. (71 18 4)			
Telegrams (144 16 3)			
	433	12	11
Supply of Miscellaneous data	10	15	0
Sale of Instruments, &c.:			
Mercantile Marine account (102 17 8)			
Royal Navy (23 12 6)			
	126	10	2
Commission charged on work done for Colonies, &c.	18	8	9
	£13,195	15	4

Expenditure.	£	s.	d.	£	s.	d.
Administration:						
Payment of Council	750	0	0			
Secretary	600	0	0			
Salaries and wages	563	6	9			
Rent, fuel, and lighting	493	1	10			
Furniture and fittings	177	13	8			
Incidental and contingent expenses	281	0	10			
Expenses contingent on Meteorological Congress	23	12	7			
Pensions	9	1	3			
				2,897	16	11
Special Researches				305	15	11
Land Meteorology:						
Observatories and stations	1,887	7	0			
Discussion and reduction of observations	1,070	2	10			
				2,957	9	10
Weather Information and Forecasts:						
Telegraphic reports and storm warnings	2,357	6	1			
Preparation and issue of reports and forecasts	1,104	0	8			
				3,461	6	9
Inspections:						
Salaries and travelling expenses				419	12	0
Ocean Meteorology:						
Discussion and reduction of observations	1,173	3	6			
Expenses incidental to the supply of instruments:						
Proportion for care and issue of instruments	150	0	0			
Royal Navy	210	4	3			
Mercantile Marine	408	10	6			
Distant island and coast stations	30	6	6			
				1,972	4	9
Balance				1,181	9	2
				£13,195	15	4

Liabilities.	£	s.	d.
To Council	750	0	0
„ sundry creditors	646	18	6
„ „ contracts (or work uncompleted)	486	2	5
„ balance	1,181	9	2
	£3,064	10	1

Assets.	£	s.	d.
By cash at Bank	1,621	13	11
„ „ at Office	126	0	7
„ „ at Valencia	50	0	0
„ H.M. Exchequer	975	0	0
„ sundry debtors	291	15	7
	£3,064	10	1

Reported—That the cash accounts for the six months ended the 30th September 1882 were audited by the Chairman and General Strachey on the 24th instant, and had been sent to the Treasury for the Audit Office. The receipts for the six months, exclusive of a balance of 1,803*l.* 2*s.* 3*d.* on the 1st April, amounted to 7,790*l.* 2*s.* 5*d.* The payments amounted to 7,366*l.* 13*s.* 6*d.*, leaving a balance of 2,226*l.* 11*s.* 2*d.* in hand and at the Bank on the 1st October 1882.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting 5 logs had been received, four of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. L. C. Dart	"Julia H."	Sept. 14—Dec. 22, 1882.	London to New York and home.	1882, p. 41.
Capt. W. Scott	Barque "Commewyne."	Sept. 5, 1882—Jan. 6, 1883.	Greenock, Surinam, and home.	1882, p. 42.
Capt. A. Simpson	Schooner "Traveller."	May 5—Dec. 4 1882.	Peterhead to Ivigtut and home.	1881, p. 82.
Capt. W. Waring	S.S. "Gordon Castle."	Sept. 9, 1882—Jan. 22, 1883.	London, China, and home	1882, p. 42.

Mr. Scott was instructed to convey the best thanks of the Council to the above observers.

Reported—That the following cheques for January were drawn this day:—

	£	s.	d.	£	s.	d.
Administration:						
R. H. Scott, salary	-		-	66	13	4
J. S. Harding, jun., salary	27	15	6			
T. D. Bell „	14	8	10			
R. G. Canham „	8	6	8			
				50	11	0
G. A. Gillett, wood, oil, &c.	-		-	1	16	4
Bond & Co., furniture and alterations	-		-	147	3	8
W. G. Schoof, clock and repairs	-		-	1	17	0
E. Higgs, cleaning windows	-		-	3	14	0
J. Perthes, maps	-		-	1	6	0
Pickford & Co., carriage of parcels	-		-	4	6	7
E. W. Wallis, books	-		-	4	0	0
Special Researches and Experiments:						
Kew Committee, actinometer observations, Minutes, 1882, p. 66				5	18	6
C. E. Strachan, Arctic observations, Minutes, 1882, p. 31	-			4	0	0
Land Meteorology:						
E. E. Cobley, computations (Letter M.O. 834, 1882)	-		-	2	0	0
J. E. Cullum, salary	-		-	16	13	4
R. H. Curtis, J. A. Curtis, T. E. Allen, C. H. Thompson, E. G. Aldridge — Discussion, &c. of Observations.	22	4	5			
	15	11	1			
	15	11	1			
	*9	14	0			
	*7	16	8			
				70	17	3
Weather Information and Forecasts:						
F. Dangerfield, delivery of D.W. Charts	-		-	11	13	3
Meteorological Society, copy of W.W. reports	-		-	4	12	0
Postmaster General, telegrams	-		-	236	5	11
F. Gaster, F. J. Brodie, G. G. Francis, A. J. Rigby, R. Sargeant — Preparation, &c. of Weather Reports.	30	4	0			
	20	1	6			
	18	4	8			
	15	0	0			
	*13	6	10			
				96	17	0
Ocean Meteorology:						
Capt. H. Toynbee, Nav. Lieut. C. W. Baillie, R.N., R. Strachan, C. Harding, H. Harries — Discussion, &c. of observations and care of instruments.	33	6	8			
	20	16	8			
	27	15	6			
	22	4	5			
	*11	14	0			
				115	17	3
Carried forward	-		-	£846	2	5

* Four weeks ending 27th January.

Office

	£	s.	d.	£	s.	d.
Brought forward -	-		-	846	2	5
Ocean Meteorology—*continued.*						
Elliott Brothers, repairing aneroids - -	-		-	7	19	0
L. Allen, travelling expenses from Dundee -	-		-	4	0	0
W. Allingham, collection of synchronous observations			-	11	16	2
"Nautical Magazine," advertisements - -	-		-	2	5	0
Pewtress & Co., printing - - -	-		-	7	0	0
H. J. Thatcher, Cardiff agent - - -	-		-	7	16	9
D. McGregor, Glasgow - - -	-		-	5	8	11
Z. Scaping, Hull - - - -	-		-	1	0	0
J. Gill, Liverpool - - - -	-		-	17	16	2
C. H. Permain, Southampton - - -	-		-	4	14	0
E. D. Archibald, Kerguelen observations (Minutes, 3rd Jan.) -				10	10	0
W. Ellis, „ „ -	10	10	0			
„ amount paid for clerical work -	6	19	6			
				17	9	6
J. Green, care of Bermuda anemometer -	-		-	4	12	0
Miscellaneous:						
J. S. Harding, jun., petty cash - -	-		-	50	0	0
Total -				£998	9	11

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.
6th January - - - -	30	7	1
13th „ - - - -	33	12	1
20th „ - - - -	31	9	7
27th „ - - - -	34	3	4
	£129	12	1

* Four weeks ending 27th January.

116, *Victoria Street, February* 14, 1883.

PRESENT:

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | LIEUT.-GENERAL STRACHEY.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Secretary reported to the Council the unexpected death, on the 9th instant, after a very short illness, of Professor H. Smith, their late Chairman. The Council thereupon came to the following resolution:

"The Meteorological Council desire to express their deep sense of the great loss they have sustained by the death of Professor Henry Smith, their late Chairman, as well as of the admirable manner in which he conducted the varied duties of his office, combining as he did the highest order of intelligence, remarkable assiduity in the discharge of business, and a union of sound judgment with urbanity, which commanded the confidence and affection of all with whom he had intercourse."

It was also unanimously resolved to request General Strachey to discharge the duties of Chairman, pending an appointment to the office in the regular manner.

General Strachey hereupon took the Chair.

The Minutes of the last meeting (January 31) were then read and confirmed.

The draft letter (No. 401) to the observatories of Armagh, Falmouth, Glasgow, and Stonyhurst, submitted at last meeting, was approved after revision, and the Secretary was ordered to forward it.

The following letter was ordered to be addressed by the Secretary to the President of the Royal Society :—

SIR, February 14, 1883.

I AM directed by the Meteorological Council to report to you, for the information of the Council of the Royal Society, the death on Friday last, the 9th of February, of their lamented Chairman, Professor H. Smith, F.R.S.

The Council await the appointment of a successor to their late Chairman, in accordance with the system established under the orders of the Treasury ; meanwhile they will conduct the duties of the office as heretofore, and I am desired to forward for your information a copy of their resolution on this subject.

I am, &c.
(Signed) R. H. SCOTT,
Secretary.

The President, Royal Society.

Submitted—The following report on the forecasts for January 1883 :—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

3.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Entire Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	31	54	43	85
,,	b	50	35	42	
,,	c	8	4	6	
,,	d	11	7	9	
SCOTLAND, E.	a	31	42	37	73
,,	b	31	42	36	
,,	c	19	12	16	
,,	d	19	4	11	
ENGLAND, N.E.	a	27	39	33	68
,,	b	38	31	35	
,,	c	31	15	23	
,,	d	4	15	9	
ENGLAND, E.	a	39	27	33	64
,,	b	27	35	31	
,,	c	19	19	19	
,,	d	15	19	17	
MIDLAND COS.	a	27	35	31	75
,,	b	46	42	44	
,,	c	15	15	15	
,,	d	12	8	10	
ENGLAND, S.	a	27	42	35	75
,,	b	46	35	40	
,,	c	15	23	19	
,,	d	12	0	6	
SCOTLAND, W.	a	15	50	33	66
,,	b	31	35	33	
,,	c	31	4	17	
,,	d	23	11	17	
ENGLAND, N.W.	a	23	39	31	77
,,	b	46	46	46	
,,	c	19	11	15	
,,	d	12	4	8	
ENGLAND, S.W.	a	23	42	33	81
,,	b	54	42	48	
,,	c	8	4	6	
,,	d	15	12	13	
IRELAND, N.	a	31	42	37	77
,,	b	42	38	40	
,,	c	8	12	10	
,,	d	19	8	13	
IRELAND, S.	a	27	35	31	81
,,	b	50	50	56	
,,	c	12	8	10	
,,	d	11	7	9	

8 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Entire Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	33	50	42	84
,,	b	47	37	42	
,,	c	10	10	10	
,,	d	10	3	6	
SCOTLAND, E.	a	27	33	30	77
,,	b	50	43	47	
,,	c	10	17	13	
,,	d	13	7	10	
ENGLAND, N.E.	a	4	7	44	70
,,	b	4	13	26	
,,	c	20	30	25	
,,	d	0	10	5	
ENGLAND, E.	a	40	27	34	65
,,	b	23	40	31	
,,	c	17	17	17	
,,	d	20		18	
MIDLAND COS.	a	33	33	35	75
,,	b	40	44	42	
,,	c	10	10	10	
,,	d	17	13	15	
ENGLAND, S.	a	33	30	32	74
,,	b	37	47	42	
,,	c	17	13	15	
,,	d	13	10	11	
SCOTLAND, W.	a	30	33	32	58
,,	b	23	30	26	
,,	c	27	17	22	
,,	d	20	20	20	
ENGLAND, N.W.	a	20	40	30	76
,,	b	57	34	46	
,,	c	10	13	11	
,,	d	13	13	13	
ENGLAND, S.W.	a	27	23	25	62
,,	b	37	37	37	
,,	c	20	30	25	
,,	d	16	10	13	
IRELAND, N.	a	37	54	46	69
,,	b	27	20	23	
,,	c	16	16	16	
,,	d	20	10	15	
IRELAND, S.	a	27	50	39	69
,,	b	37	24	30	
,,	c	20	13	17	
,,	d	16	13	14	

SUMMARY.

BRITISH ISLES	a	27	41	34	75
,,	b	42	39	41	
,,	c	17	11	14	
,,	d	14	9	11	

BRITISH ISLES	a	32	38	35	71
,,	b	38	34	36	
,,	c	16	17	17	
,,	d	14	11	12	

Submitted—The following reports of work for January:—

MARINE ROOM.

February 14, 1883.

Examined 11 new logs.

North Atlantic Weather Charts.

Preparation of observations for charting.
Instructing four female clerks in plotting the data.
Correspondence.
One clerk employed at the London or Liverpool Docks obtaining observations from ship's logs.

(Signed) CHAS. HARDING.

The Marine Superintendent.

WORK done in the TELEGRAPHIC (Forecast and Storm Warning) BRANCH (in addition to the daily routine work) during January 1883.

Charts showing the Distribution of Mean Pressure of the Air over the British Islands for each Month and for the entire Year.—For 20 years, 1861–80. New values obtained and plotted; old values carefully examined and corrected (some rejected); charts re-drawn throughout, and awaiting examination before finally drawing in the curves.

Quarterly and Annual Summaries of the Weekly Weather Report for the fourth quarter and for the whole year 1882, prepared, printed, and issued.

Preparation of Average Rainfall Values—Monthly and for the whole Year for all Stations contained in the Weekly Weather Report for the 15 years, 1866–80. About three-fourths completed.

Overtaking arrears of Forecast Checking.—Returns for *July, August,* and *September,* 1882 completed and handed in.

Checking of Forecasts for January 1883, *and preparing Special Report on some of them.*—(Re Sir E. Beckett's letter to the "Times.") Completed and handed in.

There has again been serious delay owing to the sickness of two of the best clerks, viz.,

Mr. Francis - - - - -	four days.
„ Rigby - - - - -	five days.

FREDERIC GASTER.

February 1883.

PANTAGRAPH ROOM.

Copper Plates pantagraphed:—5 plates, Nos. 15 to 19, 1878.

Zinc Plates:—Barograms, 8 plates, Nos. 22 to 29, 1878; Thermograms, 8 plates, Nos. 22 to 29, 1878; Vapour tension, 6 plates, Nos. 19 to 24, 1878; Anemograms, 6 plates, Nos. 37 to 42, 1878; Rain curves, 16 plates, Nos. 21 to 36, 1878.

Photographic Curves.—The barograms are prepared for pantagraphing as far as Plate 37, 1878. Thermograms are not in advance of the zinc plates.

Harmonic Analyser.—The analysis of the 1874 temperature curves has been carried as far as Aberdeen, which station is two-thirds finished. The constants for 1876 obtained by calculation and by the instrument have been re-plotted.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

EXAMINATION ROOM.

SIR,

THE following curves and tabulations have been examined:—December (1881): *Thermograms,* five stations; *Barograms,* one station.

October (1882): *Thermograms,* one station; *Barograms,* two stations; *Anemograms,* two stations.

December (1882): *Thermograms,* two stations; *Barograms,* two stations.

The *notes of errors* and *monthly report* thereon for October 1882 have been written out.

I was absent from office, or engaged on work other than the examinations, on six days, and Mr. Aldridge on three.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S., Secretary, Meteorological Council. (Signed) T. E. ALLEN.

The Secretary was instructed to procure for the Council a specimen of Mr. H. C. Russell's pattern of Robinson's anemometer for telegraphic stations.

He was also instructed to request Captain Toynbee to report on the progress of the Atlantic work.

He was further instructed to write to Captain Abney requesting him to submit to the Council some specimens of the cloud photographs obtained with his camera (Minutes 1881, p. 23).

116, *Victoria Street, February* 28, 1883.

PRESENT:
LIEUT.-GENERAL STRACHEY IN THE CHAIR.
MR. GALTON. | PROFESSOR STOKES.
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 14) were read and confirmed.

Read—The following letter:—

M.O. 422. The Royal Society, Burlington House,
SIR, February, 1883.

I AM directed by the President and Council to express with what deep regret they have received the news of the death of Professor Henry Smith, and to inform you that they have nominated General Strachey as Chairman of the Meteorological Council in his place.

With a view to filling up the vacancy occasioned in the Meteorological Council by this decease, the President and Council have appointed a small committee to consider the matter. That committee, as I am to state, will be happy to consult with any members of the Meteorological Council who may be able to appear here at the time of their meeting.

I am, &c.
R. H. Scott, Esq., F.R.S., (Signed) M. FOSTER,
Secretary, Meteorological Council. Sec. R.S.

P.S.—The committee will meet on Thursday, 22nd, at 3 p.m.

Reported—That the letter to the four observatories (No. 401) had been sent as directed, and its receipt duly acknowledged.

Read—The following report (Minutes, p. 99):—

SIR, Meteorological Office, February 26, 1883.

WITH reference to the Minute of the Council dated February 14th (Minutes, p. 99), requesting me to report on the progress of the Atlantic work, I have the honour to report that the present staff of the Marine Room are fully engaged on getting in data and preparing them for being entered on charts by the female clerks. Up to the time of the resignation of Mr. Green (February 21st) they have just been able to keep pace with the work.

The work is divided under the following heads:—

(*a.*) Examining shipping lists and sending forms, together with a circular letter, to all captains going on important voyages; the letter asks for extracts from their former logs, which many of them have supplied.

(*b.*) Examining the forms received daily and getting out the necessary corrections for the barometer, wind-directions, &c.

Acknowledging the forms by post-card, and asking any special questions respecting them. Also making suggestions respecting future observations.

(*c.*) Applying the corrections to the individual observations, and so preparing the forms that the female clerks shall have no difficulty in understanding what they have to enter on the charts.

(*d.*) One of the most experienced clerks in the room is fully employed in visiting ships and making extracts from their logs; he asks the captains to fill up forms for the Office in future, leaving blank forms with them, if they have not already received such by post. He also visits the offices of the chief companies, making extracts from their back logs.

I am glad to say that he meets with kind help on all sides, and, in the ways just indicated, he brings in nearly half the data received in the Office.

Up to the 23rd of February 1,062 vessels had co-operated in the work, and 3,116 forms had been received; they are distributed over the months as follows:—

Month	August.	September.	October.	November.	December.	January.	February.
No. of Forms	630	630	590	494	451	249	72

The average number of days' observations received on each *working* day since November 1st is 356, giving an average of 305 for each day since that date.

The number of charts on which the observations have been entered for each month, and the average number of sets of observations on each chart, are as follows:—

Month	August.	September.	October.	November.
No. of Charts prepared	14	9	7	7
Average number of observations on each Chart	340	300	275	205

These figures seem to show that nearly 400 observations will be available for each day's chart.

The four female clerks are now well trained, and there is good reason to believe that their entries will keep pace with the other work.

No action has been taken towards dealing with land observations, nor with regard to drawing isobars and isotherms, as the whole staff is fully employed. I have, however, devoted my own spare time to drawing tentative isobars as well as air and sea isotherms for two or three days in August.

Your, &c.

R. H. Scott, Esq., F.R.S., Secretary.

(Signed) HENRY TOYNBEE, Marine Superintendent.

Resolved—That the isobars be inserted in the August charts, at the outset, from the sea observations, the land observations to be dealt with separately at a subsequent period.

Mr. Galton expressed to the Council his opinion that it would be desirable to make arrangements for a telegraphic service to the Office at as late an hour as would admit of the preparation of forecasts for the morning papers, the observations to be taken at say 10 or 11 p.m. or even midnight; and he submitted the following letter from Mr. Abercromby on the subject:—

M.O. 475.

21, Chapel Street, Belgrave Square,
London, S.W., February 24, 1883.

DEAR MR. GALTON,

REFERRING to our conversation relative to the best means of improving forecasts, in which I stated my impression that undoubtedly the best chance would be by issuing some based on observations taken later than 6 p.m., I will now endeavour, in compliance with your request, to state my reasons more fully.

In the first place, the object should be to take observations at the latest hour that could be telegraphed to the country press. It is obvious that a forecast to be useful must be read early in the day, and nothing can compete in rapid distribution with newspaper enterprise. For the sake of argument, we will suppose observations to be taken at 11 p.m., and that only the barometer, the wind, and the weather need be wired up.

There are 27 telegraph stations in the United Kingdom which are always open—

Birmingham; Bradford; Bristol; Cardiff; Derby; Exeter; Hull; Hurst Castle; Leeds; Liverpool; London; Manchester; Newcastle; Shields; Nottingham; Plymouth; Sheffield; Southampton; Aberdeen; Dundee; Edinburgh; Glasgow; Belfast; Cork; Dublin; Londonderry (till 3 a.m.); Queenstown.

These are marked in the accompanying map by black dots, and it will be seen that, except in the north of Scotland, and, perhaps, near Valencia, they are fairly well distributed.

By taking observations so late, the European reports available at 6 p.m. would be lost, but I think that the advantage of having the British reports five hours later would far counterbalance their loss, especially as the forecaster is supposed to have studied the 8 a.m. charts.

It will also be observed that the stations are not so well adapted for watching the coasts as those at 8 a.m., but here, too, I think that the advantages far outbalance the loss, as an experienced forecaster can readily judge by the gradients what the wind will be at exposed stations.

I do not think that observations at 6 p.m. would be necessary if 11 p.m. was selected; and the press would get a more valuable forecast than at present. No chart could, however, be prepared in time for the "Times."

Then, as to the number of cases in which the 11 p.m. observations would give more valuable results than the 6 p.m., I should say that there is hardly a case of failure in the latter which could not have been possibly palliated, and sometimes prevented, by adopting the later hour. However, in this letter I will only give one example, for October 23rd, 1882, a failure which gave rise to much unfavourable comment.

By reference to fig. 2, it will be seen that at 6 p.m., the 23rd, all the indications were for W. or S.W. winds, and according to all our present knowledge, no blame can be attached to the forecaster for issuing the statement which he did. By 10 o'clock, however, a halo—the first symptom of a cyclone—was seen in London, so that an 11 o'clock observation would certainly have seen the approach of the intense cyclone shown in fig. 3 for 8 a.m. next morning. The winds produced by it were from E. and N.E., or the reverse of those which had been predicted.

I am fully aware that there are other technical difficulties in the way of adopting this suggestion, but I am so certain that no improved deductions which we will ever be able to make from the 6 p.m. charts will make up for the advantage of taking the observations five hours later, that I do not hesitate to say that no difficulties should be allowed to stand in the way of its adoption.

Yours, &c.

To F. Galton, Esq., F.R.S.

(Signed) RALPH ABERCROMBY.

The Secretary was instructed to report how often an important change has come on between 6 p.m. and 8 a.m., not foreseen at the former hour, which has produced a bad result in forecasting.

Read—Letter 305 from Lloyds, stating that they had organised signal stations at the following points on the coast (List A.), and that the proprietors of the "Shipping

Gazette" had organised others (List B.), and suggesting that the Committee would be ready to furnish meteorological reports from any of these stations if desired.

LLOYDS SIGNAL STATIONS.

A.

Southend Pier.
Deal.
*Dover.
Dungeness.
Beachy Head.
St. Catherine's Point (Isle of Wight).
*Hurst Castle.
The Lizard.
*Scilly Islands.
Lundy Island.
*St. Ann's Head (Milford Haven).
*Spurn Point.
Cromer.
Brow Head (Crookhaven, Ireland).
*Roche's Point (Queenstown, Ireland).
Malin Head (Co. Donegal, Ireland).
Rathlin Island (Co. Antrim, Ireland).
Kildonan (Mouth of the Clyde, Scotland).
*Wick, N.B.
Scrabster, N.B.
Peterhead, N.B.
*Aberdeen, N.B.

B.

Yarmouth, I.W.
Portland Bill.
*Prawle Point.
Old Head of Kinsale (Building).
Flamborough Head.
Grimsby.
*Yarmouth (Norfolk).
Aldborough.

Mr. Scott reported that he had marked with an asterisk the stations on both lists which were already reporting stations, and that he suggested the transference of the station from Dover to Dungeness.

He was authorised to have the suggested transference made, and instructed to make inquiry as to the possibility of establishing stations at Malin Head and at St. Catherine's Point (Isle of Wight), and of suppressing other stations so as to reduce the expense.

Read—A memorandum from Captain Toynbee reporting that since the last meeting eight logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. H. Parsell -	S.S. "Baltic" -	Sept. 9, 1882—Feb. 10, 1883.	Liverpool and New York, five voyages.	1882, p. 42.
Capt. Thos. Potter -	S.S. "Salerno" S.S. "Sunbeam."	April 12, 1882—Jan. 27, 1883.	Cardiff, Odessa, and New Orleans.	—
Capt. Raeburn, R.N.R.	"Lochee" -	June 6, 1882—Jan. 27, 1883.	Cardiff, Calcutta, and home.	1882, p. 9.

Mr. Scott was instructed to present the charts (O. 32) to Captain Potter, and to convey the best thanks of the Council to the other observers.

Read—Letter 442 from Dr. Meldrum (Minutes, p. 57), stating that the Meteorological Society of the Mauritius was prepared to adopt the scale for the maps of the Indian Ocean recommended by the Council.

Submitted—The report on the results of balloon experiments, by Mr. C. Harding (Minutes, 1882, p. 137). The report was referred to Mr. Galton.

Submitted—The following report of the Forecasts for the month of October 1882:—

The letters used have the following signification :—

a complete success.
b partial (*i.e.*, more than half) success.
c partial failure.
d total failure.

3.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	46	42	44	77
"	b	19	46	33	
"	c	23	8	15	
"	d	12	4	8	
Scotland, E.	a	54	46	50	81
"	b	31	31	31	
"	c	8	12	10	
"	d	7	11	9	
England, N.E.	a	58	42	50	81
"	b	23	38	31	
"	c	12	12	12	
"	d	7	8	7	
England, E.	a	42	23	33	66
"	b	23	39	31	
"	c	23	15	19	
"	d	12	23	17	
Midland Cos.	a	31	31	31	62
"	b	35	27	31	
"	c	11	15	13	
"	d	23	27	25	
England, S.	a	31	46	39	58
"	b	35	4	19	
"	c	27	23	25	
"	d	7	27	17	
Scotland, W.	a	58	58	58	77
"	b	15	23	19	
"	c	15	15	15	
"	d	12	4	8	
England, N.W.	a	39	31	35	68
"	b	27	38	33	
"	c	15	23	19	
"	d	19	8	13	
England, S.W.	a	46	46	46	75
"	b	23	35	29	
"	c	23	12	18	
"	d	8	7	7	
Ireland, N.	a	27	50	39	72
"	b	35	31	33	
"	c	27	12	19	
"	d	11	7	9	
Ireland, S.	a	27	54	41	62
"	b	23	19	21	
"	c	27	15	21	
"	d	23	12	17	

8.30 P.M.

Districts.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
Scotland, N.	a	55	52	54	78
"	b	26	23	24	
"	c	10	19	15	
"	d	9	6	7	
Scotland, E.	a	42	45	44	78
"	b	39	29	34	
"	c	10	20	15	
"	d	9	6	7	
England, N.E.	a	61	42	52	78
"	b	13	39	26	
"	c	16	13	14	
"	d	10	6	8	
England, E.	a	45	19	32	71
"	b	26	52	39	
"	c	19	23	21	
"	d	10	6	8	
Midland Cos.	a	35	32	34	69
"	b	39	32	35	
"	c	13	20	17	
"	d	13	16	14	
England, S.	a	39	45	42	71
"	b	32	26	29	
"	c	19	19	19	
"	d	10	10	10	
Scotland, W.	a	35	42	39	79
"	b	39	42	40	
"	c	10	13	12	
"	d	16	3	9	
England, N.W.	a	23	29	26	68
"	b	42	42	42	
"	c	16	19	18	
"	d	19	10	14	
England, S.W.	a	45	26	36	81
"	b	36	55	45	
"	c	6	13	10	
"	d	13	6	9	
Ireland, N.	a	32	19	26	71
"	b	39	52	45	
"	c	23	23	23	
"	d	6	6	6	
Ireland, S.	a	35	29	32	65
"	b	26	39	33	
"	c	16	26	21	
"	d	23	6	14	

Summary.

British Isles	a	42	43	43	71
"	b	26	30	28	
"	c	19	15	17	
"	d	13	12	12	
British Isles	a	41	35	38	74
"	b	32	39	36	
"	c	14	19	16	
"	d	13	7	10	

Read—The following letter :—

Sir, February 24, 1883.

It is probably within the knowledge of the Meteorological Council that in the years 1874–5, a photographic actinometer, devised by Professor Roscoe, F.R.S., was under trial, for a considerable period, at Kew Observatory.

Certain difficulties presented themselves in manipulating the instrument, and it was subsequently transferred to my care at Chatham, where I found that in its original form it was unsuited for ordinary observers.

I have, however, during the last six years, with the help of Mr. H. Darwin, introduced certain modifications in the instrument, having done away with all electrical arrangements, and driving the whole machine by clockwork.

A sheet of paper, about 18 x 8 ins., is also substituted for the original long strip of paper which was 14 feet in length. These alterations make the instrument perfectly workable. My experience of its indications leads me to the belief that there is an intimate connection between the state of the atmosphere and the rays, the energy of which it registers. I therefore submit that regular observations might be expected to yield results of high interest.

The costs in chemicals of working the instrument ought not to exceed 10*l.* a year, and the time required for reading the charts and preparing the paper need not exceed one hour per day.

I have an instrument complete which belongs to Dr. Roscoe, and he is anxious that it should be tried at Kew. I have had it working about six months, and it goes satisfactorily. I trust the Council will give effect, if possible, to Dr. Roscoe's and my own wishes.

I am, &c.

R. H. Scott, Esq. (Signed) W. DE W. ABNEY.

Mr. Scott was instructed to request Captain Abney to submit to the Council for consideration some results obtained with the instrument.

Mr. Scott stated that it had been suggested to him by Mr. J. Curtis (Letter 505) that the following mean values be calculated and printed in the volume of Hourly Readings for 1881, which is the first volume which has been printed and not lithographed :—

Barometer, monthly and yearly means (both as tabulated and as reduced to sea level).		
Dry bulb thermometer,	do.	do.
Wet bulb thermometer,	do.	do.
Rainfall,	do.	do.

He had submitted the proposal to General Strachey, who had suggested that the hourly means should be given for barometer, dry bulb thermometer, and vapour tension ; also general daily mean of the above and mean of maximum and minimum temperature. The daily mean of vapour tension not to be given. Also the hourly sums and monthly totals of rainfall, with number of rainy days, and possibly of rainy hours. Corrections for daily change of reading between the first and last observation of each series, as well as for heights above the sea, in case of barometer, to be separately shown.

General Strachey considered that the question of wind required separate consideration, and that the calculation of means at present seemed of doubtful expediency.

The following estimate from Mr. J. Curtis for carrying out the work was submitted :—

CALCULATION of MEANS for the HOURLY READINGS, 1881.

The probable time required by the staff of the Land Room to prepare the means, &c. mentioned in the Chairman's memorandum of the 19th inst., is seven weeks.

The probable cost, calculated on present rates of pay, is 42*l.* 15*s.* 2*d.*

(Signed) J. A. CURTIS.

R. H. Scott, Esq. February 27, 1883.

Note.—A little uncertainty attaches to this estimate, owing to the fact that the greater portion of the work must be done from the printed sheets, where the figures are very small and likely to prove trying to the eyes.—J. A. C.

The further consideration of this matter was postponed.

Resolved—That an honorarium of thirty guineas be given to Mr. R. Strachan for his own work at extra time in the preparation of Part III. of the Arctic Meteorology, being the same amount as had been given to him for Part II. (Minutes, 1880, p. 49).

Read—Letter 225 from the Secretary to the International Fisheries Exhibition, requesting the assistance of the Council in organising a Conference on the subject of Storm Warnings, to be held at the time of the Exhibition.

The Secretary was instructed to reply that the Council would be glad to render such assistance as the Office could afford (P. C. 474).

Reported—That there had been an outbreak of typhoid fever at Valencia Observatory. Mr. Scott was directed to have the drainage arrangements inside the house, which have been found to be defective, set to rights immediately.

Office

Reported—That Mr. A. W. Green had resigned (Minutes, p. 43).

Captain Toynbee recommended that Mr. F. T. Bullen (Minutes, p. 65) be permanently engaged in Mr. Green's place, and that Mr. James's salary be raised from 1*l.* 19*s.* 2*d.* to 2*l.* 4*s.* 2*d.* per week from the 26th instant. This was approved.

The salary of E. Hood was raised from 12*s.* to 14*s.* a week (Minutes, p. 43) from the 26th instant.

Reported—That Mr. R. F. Wallace had been appointed assistant to Mr. Baillie, at an initial salary of 25*s.* per week.

The foregoing changes were approved.

The following cheques for February were drawn this day:—

	£	s.	d.	£	s.	d.
Administration:						
A. J. Hodges, Council income tax				27	1	8
R. H. Scott, salary				66	13	4
J. S. Harding, jun. (Salaries)	27	15	6			
T. D. Bell (Salaries)	14	8	10			
R. G. Canham (Salaries)	8	6	8			
				50	11	0
Pall Mall Coal Company, coals				8	16	0
Pickford & Co., carriage of parcels				5	5	6
E. W. Wallis, books				1	2	6
Wightman & Co., printing				2	6	6
W. G. Schoof, timepiece				1	4	0
Special Researches and Experiments:						
De la Rue & Co., sunshine cards				8	15	0
Malby and Sons, compiling Rainfall Maps (Minutes, 1882, p. 41)				2	14	0
W. Marriott, obtaining Means of Sea Temperature observations (Minutes, 1882, p. 88)				11	1	3
R. W. Munro, removing harmonic analyser				2	0	0
C. E. Strachan, Arctic work (Minutes, 1882, p. 31)				2	5	0
C. Harding, report on balloon observations (Minutes, 1881, p. 137)				6	0	0
Land Meteorology:						
Bank of England, sale of stationery forms				5	18	8
E. E. Cobley, computations	2	7	0			
R. H. Curtis, anemograph scales	5	5	0			
				7	12	0
R. W. Munro, copper chimneys				1	17	0
J. E. Cullum, salary				16	13	4
R. H. Curtis (Discussion, &c. of Observations.)	22	4	5			
J. A. Curtis (Discussion, &c. of Observations.)	15	11	1			
T. E. Allen (Discussion, &c. of Observations.)	15	11	1			
C. H. Thompson (Discussion, &c. of Observations.)	*9	14	0			
E. G. Aldridge (Discussion, &c. of Observations.)	*7	16	8			
				70	17	3
Weather Information and Forecasts:						
Negretti & Zambra, instruments				2	18	6
Spottiswoode & Co., Prawle Point, wire				17	0	0
Post Office, Office private wire	22	0	0			
,, telegrams	226	4	4			
				248	4	4
Wightman & Co., book post wrappers				7	0	0
F. Gaster (Preparation, &c. of Weather Reports.)	30	4	0			
F. J. Brodie (Preparation, &c. of Weather Reports.)	19	13	0			
G. G. Francis (Preparation, &c. of Weather Reports.)	19	13	0			
A. J. Rigby (Preparation, &c. of Weather Reports.)	15	0	0			
R. Sargeant (Preparation, &c. of Weather Reports.)	*12	3	0			
				96	13	0
Carried forward				£670	9	10

* Four weeks ending 24th instant.

	£	s.	d.	£	s.	d.
Brought forward -	-		-	670	9	10
Ocean Meteorology:						
Captain H. Toynbee - -	33	6	8			
Nav. Lieut. C. W. Baillie, R.N.	20	16	8			
R. Strachan - - -	27	15	6			
C. Harding - - -	22	4	5			
H. Harries - - -	*11	14	0			
Discussion &c. of observations, and care of instruments.				115	17	3
Negretti & Zambra, repairing instruments -	79	3	0			
,, new instruments - -	69	19	0			
				149	2	0
W. Allingham, collection of synchronous observations -			-	13	1	10
J. H. Woodstock, packing cases - -			-	3	14	0
Miscellaneous:						
Chance Bros. & Co., commissions - -			-	7	10	0
Negretti & Zambra, ,, - - -			-	23	0	6
J. S. Harding, jun., petty cash - -			-	50	0	0
				£1,032	15	5

The following cheques for weekly salaries were drawn on the dates specified:—

	£	s.	d.
3rd February - - -	33	9	7
10th ,, - - -	33	17	1
17th ,, - - -	33	17	1
24th ,, - - -	34	2	1
	£135	5	10

* Four weeks ending 24th instant.

116, *Victoria Street, March* 14, 1883.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE.	PROFESSOR STOKES.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 28) were read and confirmed.

Read—The following letter (No. 604) :—

MY DEAR SIR, Colonial Office, March 13, 1883.

AS it appears that the Governor of the Windward Islands has published officially Mr. Wiggins' weather prophecies (of a storm for March 11), and other Governors may be doing the same, it will be of advantage to the Colonial Office to know whether the Meteorological Council are of opinion that such predictions or announcements can properly or prudently be so officially recognised.

(Signed) R. G. W. HERBERT.

R. H. Scott, Esq.

The Secretary was instructed to send the following reply :—

M.O. 604.

SIR, March 15, 1883.

IN reply to your letter of the 13th instant, I am desired by the Meteorological Council to express their opinion that notices such as that in the "Barbados Official Gazette" of January 11th, to which you refer, giving a warning on January 11th last as to the probable occurrence of a "disastrous storm" over the Atlantic in the present month of March, are necessarily mischievous.

In the present state of science it is quite impossible to foresee the condition of the weather, otherwise than for a very limited period of time and for a limited area, and then only on the consideration of a large number of observations made over the area generally, which in the present case was obviously out of the question.

I am, &c.

Sir Robert G. W. Herbert, K.C.B.,
Under Secretary of State,
Colonial Office.

(Signed) ROBERT H. SCOTT,
Secretary.

Read—The following letter (Minutes, p. 88) :—

M.O. 541.

FALMOUTH OBSERVATORY.

MY DEAR SIR, Falmouth, March 3, 1883.

I LAID your letter of the 21st ultimo before my Committee at their last meeting, and they have requested me to forward you the copy of the resolution which was passed, which will be found on the other side.

Yours, &c.

Robert H. Scott, Esq., F.R.S.,
Secretary, Meteorological Council,
London, S.W.

(Signed) WILSON L. FOX,
Hon. Sec., Meteorological Committee.

COPY.

"A letter from Mr. Robert H. Scott, F.R.S., having been read, it was unanimously resolved that the Committee express their deep regret and surprise that the Meteorological Council contemplate the discontinuance from the 31st of December next of the annual grant hitherto made to the Royal Cornwall Polytechnic Society for the maintenance of the Falmouth Observatory, and that Mr. Scott be asked to be good enough to inform the Committee upon what grounds the Council's proposal with regard to the Falmouth Observatory has been based, in order that the whole matter may be laid before the General Committee of the Polytechnic Society, who, since the establishment of the observatory at Falmouth, have identified themselves with its success, and who, owing to its great utility and important geographical position, regard it as of national importance."

The Secretary was instructed to send the following reply :—

M.O. 541.

SIR, March 15, 1883.

IN reply to your letter of the 3rd instant, I am directed by the Meteorological Council to inform you that they cannot find any record of any engagement on the part of their predecessors to maintain the Falmouth Observatory permanently.

On the contrary, it was certainly not the intention of the Meteorological Committee, in 1867, that all the self-recording observatories should be maintained permanently, and the Council are unable to recognise any claim on the part of the Royal Cornwall Polytechnic Society to continue to receive a grant for the maintenance of the meteorological observatory at Falmouth after the time has come, as in their opinion it has now come, for closing it.

The original resolution under which the Falmouth Observatory was opened makes the continuance of the grant for it dependent on the annual grant being continued in the Estimates, thus showing that the arrangement was an annual one.

At the same time, if the Royal Cornwall Polytechnic Society has been put to any expense which has not been fairly met by the annual grants, the Meteorological Council will be prepared to consider any representation that the Society may desire to make on this point.

I am, &c.

(Signed) ROBERT H. SCOTT,
Sectetary.

W. L. Fox, Esq.,
Hon. Sec. of the Meteorological Committee,
Royal Cornwall Polytechnic Society.

Read—The following letter (See Minutes, 1881, p. 92) :—

M.O. 516.

Scottish Meteorological Society,
Albert Buildings, 6, Shandwick Place,
Edinburgh, March 10, 1883.

SIR,

As you are aware, meteorological observations on Ben Nevis were again resumed by Mr. Wragge last year on June 1st, and continued daily till the end of October.

The observations made on Ben Nevis and its slopes during the summer of 1882 were more extensive and complete than those of 1881. A string of stations from the sea to the top of the Ben were established, and equipped with the requisite instruments, and the continuity of the observations, including simultaneous observations at two lower level stations with those at the top, was secured by the services of two paid assistants during the season. The positions of the stations are shown on the sketch of Ben Nevis left by Mr. Stevenson in the Meteorological Office. The object aimed at by this elaborate system was the observational data for determining the vertical distribution of the different meteorological elements, the importance of a knowledge of which, particularly in relation to weather changes, was suggested by the discussion, so far as yet overtaken by Mr. Buchan, of the Ben Nevis observations of 1881.

A series of rain-gauges were planted at different points on the slope of the mountain, and over the plateau at the top: the latter series for the purpose of ascertaining the influence of the great cliff of the mountain (about 1,800 feet high) on the rainfall at various distances from its edge.

The observations at 9 a.m. were telegraphed to your Office, and appeared in the "Daily Weather Reports," together with observations made simultaneously at Fort William.

The expense incurred in carrying on these observations amounts to 220*l*. Towards the defraying of this expense a grant of 50*l*. has been made by the British Association, thus leaving a sum of 170*l*. still to be raised by the Council of the Society.

The Council have in the meantime been making efforts to raise 5,000*l*. for building, equipping, and partially endowing an observatory on the top of Ben Nevis. Title deeds have been prepared, and subscriptions amounting to 1,600*l*. have been obtained within the past few months. The Lord Provost and citizens of Glasgow have taken up the project with earnestness and vigour, and a committee has been formed, with Mr. John Burns, convener, to raise subscriptions, and it is anticipated that if not the whole balance, at least so large a portion of it will be raised, as virtually to secure the success of the scheme. I have thought it right to inform the Meteorological Council of what is being done to establish the observatory, in consideration of your letter of January 5th, 1882.

In these circumstances I am requested by the Council to inquire whether the Meteorological Council are willing to aid the Society, as was done last year, in defraying the expenses incurred in making the observations on Ben Nevis during 1882.

I am, &c.

(Signed) J. SANDERSON,
Hon. Treasurer, Scottish Meteorological Society.

R. H. Scott, Esq.,
Secretary, Meteorological Council.

The Secretary was instructed to reply (P.C. 587) that, in the expectation that the arrangements for establishing a permanent station will be completed during the course of the present year, and that a wire may be erected for the transmission of the observations to a telegraph station, by which they would become available for the forecasts issued in the forenoon, the Council make a grant of 100*l*. for the present year. They trust, however, that arrangements may be made for the earlier transmission of the messages, so that they may reach the Office not later than 1 p.m. daily.

Submitted—The following Report (Minutes, p. 101) :—

DAILY FORECASTS.

SIR,

March 14, 1883.

IN compliance with your instructious to report "how often changes of weather have come "on between 6 p.m. and 8 a.m., not foreseen at the former hour, which have produced bad results "in forecasting," I beg to report as follows:—

I have examined carefully the forecasts issued during the six months, October 1881 to March 1882, and find that during that period there were 16 sets of forecasts issued which proved to be serious failures, nearly all of them through changes which set in unexpectedly after the 8 p.m. forecasts had been issued. Their dates are :—

1881, October 7, 8, 9; November 1; December 12, 31.

1882 January 5, 8, 18, 28; February 1, 4, 27, 28; March 3, 22.

I do not think that in more than one or two of these cases forecasts prepared at midnight would have been any better than those issued at 8 p.m., but of course it would require a very careful study of each case to say so with certainty.

I am, &c.

R. H. Scott, Esq., Secretary. (Signed) FREDC. GASTER.

The Secretary was instructed to inquire as to the latest hour at which forecasts could be received in London for the country press, and to forward a copy of the above report to Mr. Abercromby, with an offer of the forecast book for examination.

Submitted—The following Report (Minutes, p. 162) :—

TELEGRAPHIC REPORTING STATIONS.

SIR, March 14, 1883.

1. WITH regard to the question of transferring the meteorological instruments from *Dover* to *Dungeness*, may I state that I think that the present exposure of the instruments at *Dover* is so thoroughly bad, that if there is a better position available at Dungeness, the change could not fail to be beneficial. If, however, a new and good position at Dover could by any means be obtained, it would be desirable to retain Dover as the reporting station for very many reasons. We have now good rainfall and temperature averages calculated for the station; and the mere fact that so many of the Continental packet boats start from Dover, makes the station a very useful one to the travelling portion of the community.

2. It would be a great advantage if the instruments at Hurst Castle could be transferred to a good position at St. Catherine's Point, Isle of Wight, as there can be no doubt that both the winds and sea disturbance now reported from Hurst Castle are defective. No additional charge would (I presume) be occasioned by the change.

3. If a good exposure can be obtained for instruments at Malin Head, the establishment of a station at that point would be very desirable, and in order to reduce the cost, I would suggest that the telegrams now received from Hawes Junction twice daily should be dispensed with, as they are of no practical value at present, either for forecasting or storm-warning purposes. I would, however, suggest that the instruments now at Hawes Junction be allowed to remain there, and that the observer should continue to send up his monthly schedule of observations, for which he should receive some remuneration.

As soon as there is time available, some discussion should be attempted of the observations already received from Hawes Junction, in order to see whether there is any practical advantage to be derived from readings taken at that altitude. Hitherto we have not found them to be of any value.

If anything can be done in order to provide a better station than Ardrossan for telegraphic reports, it would be a great boon, as the winds reported from that station are so very local, that they are useless both in preparing and checking the forecasts.

I am, &c.

R. H. Scott, Esq., Secretary. (Signed) FREDC. GASTER.

The draft of the Barometer Manual for Seamen was further considered.

Submitted—An estimate (Letter 592) for the repairs at Valencia amounting to 12*l.* 15*s.* 6*d.* (Minutes, p. 104).—Accepted.

Submitted—A memorandum (Letter 834, 1882) from Mr. J. A. Curtis, asking permission for himself and Mr. A. H. Bell to complete, at extra hours, the checking of the calculation of the monthly and five-day means for the observatories for the year 1878, the work having been left unfinished owing to the death of Mr. C. Burton. The total estimated cost of the work is 21*l.* 1*s.* 6*d.*

Mr. Scott stated that the work could not be completed in the Office without considerable interference with the work of Mr. Curtis' room.—Approved.

Reported—That Captain Toynbee suggested the appointment of Captain Fowler, Superintendent of the Sailors Home, Cardiff, to be agent for that port, in place of Mr. Thatcher (Letter 31).—Approved.

The Secretary reported that the Office received regularly reports from certain distant stations, and that he saw no immediate prospect of discussing or publishing the results from such stations, as, for instance, the six stations in Cyprus (Minutes, 1880, p. 51) or that in Norfolk Island (Minutes, 1877, p. 76). He was instructed to inquire if the Austrian Meteorological Service would publish the returns from Cyprus, and if the Government of New South Wales would undertake the management of the station in Norfolk Island on condition of the instruments being presented to it.

Submitted—A specimen anemometer on Robinson's principle, fitted for use in the hand, being the pattern introduced by Mr. H. C. Russell for the telegraphic system of New South Wales. The subject was referred to Mr. Galton.

Read—A memorandum from Captain Toynbee, reporting that since the last meeting ten logs had been received, seven of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Com. E. Bourke -	H.M.S. "Gannet."	Jan. 1—Dec. 31, 1882.	On West Coast of South America.	1881, p. 134.
Lieut. A. Carpenter, Lieut. A. Balfour.	H.M.S. "Magpie."	Sept. 1, 1882—Jan. 1, 1883.	Surveying on Coast of Corea.	1882, p. 57.
Capt. W. C. Crutchley, R.N.R.	S.S. "African" -	Dec. 20, 1882—Feb. 28, 1883.	Plymouth, Cape Town, Natal, and home.	1882, p. 41.
Capt. T. W. Freeman.	S.S. "Bellerophon."	Oct. 27, 1882—March 4, 1883.	London, China, and home	1882, p. 41.
Capt. G. H. Jones -	S.S. "Lamperts"	April 21—Sept. 16, 1882.	India, Marseilles, &c., and home.	1881, p. 138.
Capt. John Smith -	Barque "Naiad"	March 30, 1882—Feb. 21, 1883.	Liverpool to West Coast of South America.	1881, p. 138.
Capt. P. S. Tomlin -	S.S. "Ballaarat"	Nov. 11, 1882—March 7, 1883.	London, Melbourne, &c., and home.	—

Mr. Scott was instructed to present the Charts (O. 27) to Captain Tomlin, and to convey the best thanks of the Council to the other observers.

Read—Letter 611, from Captain Abney, accompanied by specimens of his cloud photographs (Minutes, p. 99).

Submitted—The following list of instruments proposed to be ordered:—

	Estimated Cost. £	s.	d.
12 rain-gauges (for telegraphy and stations) - - -	24	0	0
12 solar thermometers *in vacuo* (for stations) - - -	18	0	0
25 ship thermometer-screens (Mercantile Marine account) - -	13	10	0
Total probable cost - - -	£55	10	0

R. STRACHAN,
March 13, 1883.

The order was approved.

Submitted—The following statements of work for February:—

MARINE ROOM.

March 14, 1883.

Examined 9 new logs.

North Atlantic Weather Charts.

Preparation and charting of observations.

Correspondence in connexion with the despatch of forms and receipt of observations.

One member of the staff solely employed in obtaining observations from ships arriving in London and Liverpool.

Mr. Green has left the Office, having received a Civil Service appointment. The vacancy thus caused has not yet been filled up.

(Signed) CHAS. HARDING.
The Marine Superintendent. „ HENRY TOYNBEE.

March 14, 1883.

TELEGRAPHIC (FORECAST and STORM WARNING) BRANCH, in addition to the Daily Routine Work.

Charts showing the Distribution of Mean Pressure over the British Islands, for each month and the entire year.—For 20 years, 1861–80.—Completed, and sent to press.

Rainfall Map of British Islands (for the whole year) from 15 years of Observations, 1866-80.—Drawn, and sent to press.

Arrears of Forecast Checking.—Done up to end of October, 1882.

Mean Rainfall Values for each month and the whole year, for all Stations contained in the Weekly Weather Report.—For the 15 years, 1866–80.—Completed.

Mean Pressures at 8 a.m. for Stations in the Daily Weather Report.—For 10 years, 1871–80.—About half done.

Mean Temperatures for same Stations and same period—About one third done.

Checking of Storm Warnings issued in 1882.—About one-eighth done.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

Copper Plates pantagraphed:—8 plates, Nos. 20 to 27, 1878.

Zinc Plates:—Barograms, 6 plates, Nos. 30 to 35, 1878; Thermograms, 6 plates, Nos. 30 to 35, 1878; Vapour Tension, 7 plates, Nos. 25 to 31, 1878; Anemograms, 9 plates, Nos. 43 to 51, 1878.

Photographic Curves are prepared for pantagraphing as far as Plate 43 in the case of the barograms; the thermograms are not in advance of the zinc plates.

Harmonic Analyser.—The analysis of the temperature curves for 1874 has been carried as far Stonyhurst, which station is almost completed. During the month the instrument was shifted to another room, and a good deal of time was taken up in making some re-adjustments necessitated by the change.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

Submitted—The following report on the forecasts for February 1883:—

The letters used have the following signification:—

a complete success. | **c** partial failure.
b partial (*i.e.*, more than half) success. | **d** total failure.

FEBRUARY.

3.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	46	54	50	79
,,	b	29	29	29	
,,	c	17	4	11	
,,	d	8	13	10	
SCOTLAND, E.	a	38	25	32	75
,,	b	37	50	43	
,,	c	13	13	13	
,,	d	12	12	12	
ENGLAND, N.E.	a	46	42	44	86
,,	b	46	38	42	
,,	c	8	8	8	
,,	d	0	12	6	
ENGLAND, E.	a	33	42	38	81
,,	b	50	37	43	
,,	c	13	4	9	
,,	d	4	17	10	
MIDLAND COS.	a	46	29	38	77
,,	b	37	42	39	
,,	c	17	17	17	
,,	d	0	12	6	
ENGLAND, S.	a	38	50	44	75
,,	b	41	21	31	
,,	c	21	17	19	
,,	d	0	12	6	
SCOTLAND, W.	a	38	46	42	75
,,	b	33	33	33	
,,	c	12	4	8	
,,	d	17	17	17	
ENGLAND, N.W.	a	29	38	34	75
,,	b	46	37	41	
,,	c	17	13	15	
,,	d	8	12	10	
ENGLAND, S.W.	a	50	46	48	75
,,	b	21	33	27	
,,	c	12	13	13	
,,	d	17	8	12	
IRELAND, N.	a	50	59	55	84
,,	b	29	29	29	
,,	c	17	4	10	
,,	d	4	8	6	
IRELAND, S.	a	42	42	42	73
,,	b	25	37	31	
,,	c	12	17	15	
,,	d	21	4	12	

8.30 P.M.

DISTRICTS.		Percentages. Wind.	Weather.	Average Forecast.	Percentage of Success a + b.
SCOTLAND, N.	a	39	61	50	88
,,	b	50	25	38	
,,	c	4	11	7	
,,	d	7	3	5	
SCOTLAND, E.	a	54	54	54	81
,,	b	21	32	27	
,,	c	11	11	11	
,,	d	14	3	8	
ENGLAND, N.E.	a	57	43	50	89
,,	b	32	46	39	
,,	c	4	4	4	
,,	d	7	7	7	
ENGLAND, E.	a	46	46	46	86
,,	b	43	36	40	
,,	c	7	11	9	
,,	d	4	7	5	
MIDLAND COS.	a	39	47	43	86
,,	b	46	39	43	
,,	c	11	7	9	
,,	d	4	7	5	
ENGLAND, S.	a	39	46	43	86
,,	b	43	43	43	
,,	c	18	7	12	
,,	d	0	4	2	
SCOTLAND, W.	a	36	50	43	79
,,	b	39	32	36	
,,	c	18	11	14	
,,	d	7	7	7	
ENGLAND, N.W.	a	36	46	41	75
,,	b	43	25	34	
,,	c	11	25	18	
,,	d	10	4	7	
ENGLAND, S.W.	a	43	36	40	77
,,	b	29	46	37	
,,	c	21	11	16	
,,	d	7	7	7	
IRELAND, N.	a	46	64	55	80
,,	b	29	21	25	
,,	c	21	11	16	
,,	d	4	4	4	
IRELAND, S.	a	43	50	47	79
,,	b	32	52	32	
,,	c	14	11	12	
,,	d	11	7	9	

SUMMARY.

BRITISH ISLES	a	42	43	43	78
,,	b	36	35	35	
,,	c	14	10	12	
,,	d	8	12	10	
BRITISH ISLES	a	43	49	46	82
,,	d	37	34	36	
,,	c	13	11	12	
,,	d	7	6	6	

116, *Victoria Street, March* 28, 1883.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. DE LA RUE. | PROFESSOR STOKES.
MR. GALTON. | THE HYDROGRAPHER.
MR. STONE.

The Secretary was in attendance.

The Minutes of the last meeting (March 14) were read and confirmed.

Read—The following letter:—

(M.O. 627.) Royal Society, Burlington House, W., March 15, 1883.

SIR,

I AM directed by the President and Council of the Royal Society to inform you that at their meeting to-day they nominated Mr. E. J. Stone to fill, as a member of the Meteorological Council, the vacancy occasioned by the death of the late Prof. Henry Smith, and have communicated this nomination to my Lords of the Treasury.

I am, &c.

R. H. Scott, Esq., F.R.S., Secretary of the Meteorological Office.

(Signed) M. FOSTER, Secretary R.S.

The Secretary reported that by instruction of the Chairman he had summoned Mr. Stone to attend the present meeting.

The draft of the Barometer Manual for Seamen was further considered.

Read—The following letter (Minutes, 1878 p. 78):—

(M.O. 664.) 21, Chapel Street, Belgrave Square, London, S.W., March 20, 1883.

SIR,

I HAVE the honor to inform you that the draft of the portion of the Barometer Manual, relating to synoptic forecasting, which I have been writing for the Meteorological Council, is nearly completed.

As it stands now, the length when printed would be about 50 pages of royal 8vo. print, with about 130 diagrams.

I should be much obliged if you could inform me whether this is about the size of work which the Council wish, so that in the revision I may endeavour to make it conform to their wishes.

In case the number and size of the diagrams may be of importance in estimating the probable cost, I may mention that there will be approximately:—

30 charts of the N. Atlantic, about the size marked A on the appended paper (4 ins. square);
60 small charts, giving wind and isobars, size B ($3 \times 2\frac{1}{4}$ ins.);
15 larger charts, giving also weather symbols, size C ($4\frac{1}{2} \times 3$ ins.);
25 miscellaneous diagrams, various sizes, but all very simple.

Perhaps I may be permitted to remark that in addressing the general public on such an unfamiliar subject as synoptic charts, an explanation without a diagram is almost unintelligible.

I have, &c.

The Secretary, Meteorological Office.

(Signed) R. ABERCROMBY.

The Secretary was instructed to draft a reply to Mr. Abercromby, generally accepting his proposals, subject, however, to their final decision as to printing the work; the number of illustrations, and the extent to which the Council would be prepared to express their adoption of the views it takes, being reserved until they have seen the manuscript.

Read—Letter 677, from Mr. Symons, relative to the resolution of the Council (Minutes, p. 88), to insert a Rainfall Map in the Tables of British Rainfall which he had supplied to the Office.

Resolved—That the Rainfall Chart be not inserted in these Tables.

Professor Stokes submitted a proposal to have an instrument constructed to draw graphically the results obtained by the Harmonic Analyser. This was approved, and he was requested to communicate his plan when matured.

Read—Letter 663 from Captain Abney, forwarding bills amounting to 25*l.* 17*s.*, for alterations to his Cloud Camera. The bills were ordered to be paid.

The Secretary was instructed to pay the 100*l.* to the Scottish Meteorological Society for the observations taken on Ben Nevis in 1882 (Minutes, March 14).

Mr. Scott submitted an account for 4*l.* 2*s.*, for the calculation of the Hourly Totals of the Frequency and Amount of Rain at the Seven Observatories, which had been done by Mr. C. H. Thompson at extra hours. Sanctioned.

It was resolved that 50 copies of Mr. Scott's work "Elementary Meteorology," should be printed for distribution among the staff and observers of the Office.

Read—A memorandum from Captain Toynbee reporting that since the last meeting five logs had been received, three of them being "excellent."

Observer.	Ship.	Period.	Voyage.	Last mention on Minutes.
Capt. W. Barron -	S.S. "Empress"	Oct. 30, 1882—March 9, 1883.	Hull and Hamburg (eight voyages).	1882, p. 57.
Capt. P. Aldrich, log kept by Lieut. A. C. Williamson.	H.M.S. "Fawn"	May 31, 1882—March 18, 1883.	Aden to Mauritius, Cape of Good Hope, Madagascar, and home.	1882, p. 41.
Capt. W. Lailey -	S.S. "Olympus"	Aug. 10—Oct. 30, 1882.	To Port Said and back, carrying troops.	1882, p. 41.

Mr. Scott was instructed to present the charts (O. 27) to Mr. Williamson, and to convey the best thanks of the Council to the other observers.

The Chairman submitted the corrections to Mr. Perry's Tables on the Meteorology of Kerguelen (Minutes, 1880, p. 17). The Secretary was instructed to forward them to Mr. Perry as before resolved.

Reported—That Mr. F. H. Bevan had been engaged on the terms of a Civil Service writer, to fill the vacancy in the Marine Room caused by Mr. Bullen's promotion (Minutes, p. 105).

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[502.—25.—4/83.]